JUNE, 1952

Traffic Engineering

Municipal Parking Lot in Syracuse

- Traffic Engineering in Syracuse, New York
- Major Problems of Transit Operations Related to Traffic Engineering
- Common Interests of Automotive and Highway Engineers
- Warrants for Right-Turn Arrows
- Tests to Determine a Splash Pattern (Reference Notes)

Official Publication of the Institute of Traffic Engineers

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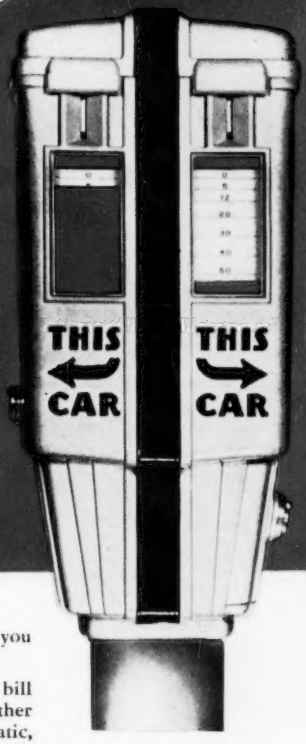

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Traffic Engineering

OFFICIAL PUBLICATION OF THE INSTITUTE OF TRAFFIC ENGINEERS

VOLUME XXII | JUNE, 1952 | NUMBER 9

COVER: A view of one of the two municipal parking lots developed by Syracuse's Bureau of Traffic and Lighting for the City's Parking Authority, and now operated by the Bureau. The layout is an interesting example of the efficient utilization of a triangular plot of ground to provide maximum access maneuverability.

Traffic Engineering is that phase of engineering which deals with the planning and geometric design of streets, highways, and abutting lands, and with traffic operation thereon, as their use is related to the safe, convenient, and economic transportation of persons and goods.

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Frankly Speaking

Traffic Engineering in a "Guns and Butter Economy"

THE present policies we are pursuing in this nation of maintaining a "guns and butter economy" creates a shortage of engineers which is developing an impact of severe proportions in the field of highway transportation. The extension of our productivity so as to encompass a high level of production in both military and consumer goods, places a special emphasis on technological processes which in turn, demand engineering skills for their development. Accordingly private enterprise is outbidding public agencies for the services of engineers and our highway departments and public works agencies are losing many of their skilled technicians in this competition for their services. At the same time the armed forces are drawing off many of the younger college graduates for military purposes.

It is generally recognized that engineering skill must be developed and applied if highway transportation is to go forward. Just how these skills can be developed is a problem of major proportions to the highway officials of this nation. It seems that one of the more intelligent steps which may be taken is to adopt an in-service training program for the training of skilled highway personnel. Such a program logically would be centered in each state wherein the state highway department and the municipal public works officials would join hands with the state university and develop curricula and training processes which would inspire the younger man and elevate him to a higher degree of competency in applying engineering disciplines to our highway and parking problems. Unless such steps are taken, there is foreseen a terrific drought of competent engineering personnel so necessary to carry on the fundamental work required to keep highway transportation at a high level of service. With adequate numbers of men trained in the basic engineering disciplines, there will be a source of manpower for specialization in the sundry phases of highway development including traffic engineering functions.

Highway transportation has become a basic part of existence in this nation and is vitally necessary in maintaining the economy. If high levels of production are to be maintained, highway transportation cannot be permitted to lag. Not only basic but also special engineering skills are vitally necessary to this end.

Theodore M. Matson

Director

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Traffic Engineering in Syracuse

By William F. Kavanaugh (Mem., ITE)
Traffic Engineer, City of Syracuse, New York

This is the thirteenth in a series of articles to be published in "Traffic Engineering" magazine, and written by traffic engineers of cities of various sizes in several parts of the country. The population of Syracuse is 220,000.

A RELIEF map of the territory in which Syracuse is situated would show that the city generally is located on four hills and their intervening valleys. The valley running in an east-west direction is an extension of the plain that traverses the central part of New York State from Albany to Buffalo and in which were constructed the old Erie Canal later followed by the New York Central Railroad main line. The valley extending in a north-south direction contains Salina Street, the main street of the city, which is also a part of federal route No. 11. The line of this street follows an old Indian trail. Due to the topography, grades on some primary arteries range between six and eight per cent, while on some secondary arteries, grades approaching twelve per cent exist.

The old village of Syracuse from which the present city grew was originally settled on swampy land near the junction of the two valleys. Other villages were located on higher land in the vicinity, and it was a combination of several of these with the village of Syracuse that formed the present city. Each of these communities had a street layout peculiar to its topography and needs, which served the various sections adequately but when these were combined into one system, a very irregular pattern resulted.

Canals and Railroads Control Street Pattern

Further complications arose when the Erie and Oswego Canals were constructed through the city. When the Syracuse and Utica Railroad Company was granted a franchise to build its line through a city street and subsequently to connect with the Auburn and Syracuse railroad, Syracuse became known as the city with the trains running on its main street.

Building of the canals and railroads made Syracuse a transportation center and aided materially in the development of the city. But these same transportation mediums were to create serious traffic problems in the future. Syracuse is not traversed by any large streams. Onondaga Creek is the only stream of any size cutting the line of city streets. Fortunately, no long span bridges are required over this creek, which empties into Onondaga Lake, the lower section of which is included within the city limits.

In the early days, streets of the business section were under water during a large part of the year due to overflowing of Onondaga Creek, caused by backing up of lake waters. Onondaga Lake at that time had no defined outlet, merely overflowing through a marsh to the Seneca River. An outlet was dug for the lake which had the effect of lowering the level of the creek near the center of the village about twenty-four feet; thereby "taking the streets out of the mud." The elevation of one of the collateral hills in the northeast section was reduced by fifty-five feet and the excavation used to raise the elevation of a low part of the business section about fourteen feet. Log roads were built in the marshy sections between the hills and the more troublesome small creeks and brooks were confined in culverts.

Fig. 1
Pavement Marking and Refuge Island Aid Vehicles and Pedestrians.

As the city progressed, additional sections were developed and new streets laid out. Several additional railroads were granted franchises for tracks in various parts of the city. These were gradually absorbed in the two existing systems. It was about the turn of the century before railroad construction was halted, and the street pattern became fairly definitely established.

In 1865, the first franchise was granted "to construct, operate and maintain a street railway, to be operated with horses." In 1889, electricity was recognized as an alternate to animal power in street railway franchise grants. By 1897, electricity was used exclusively for motive power and one company assumed control over operations on all existing lines. Extension of the street railway system was continued until about 1917. Several suburban electric lines were constructed to nearby communities by the local transit company, and others.

About the turn of the century, interurban electric trolley passenger and freight service was established between downtown Syracuse and communities in several directions, some as far as one hundred miles distant.

About the same time, a novelty appeared on the city streets, the horseless carriage, or gas buggy. This new contraption caused no concern to officials concerned with traffic movement for several years, but as it moved from the luxury

class to common usage for transportation of persons and goods, its increase in numbers made a few alert officials wonder just what to do about it.

Downtown Parking Ban Tried in 1923

Conditions were aggravated by a new problem created by users of the fast developing automobile. Persons who used it for business or commercial use insisted on the right to park along the curb. No official action was taken to discourage this practice. As a result, shortly after the first world war, the streets of downtown Syracuse were lined with practically solid lines of parked cars, between intersections. About 1923, the Commissioner of Public Safety banned all parking in the downtown area. This ban was lifted after two days of trial because "the public wouldn't stand for it."

In 1921, the county registration of motor vehicles totaled 25,700. By 1929, a peak of 76,200 had been reached. This phenomenal increase in the use of such vehicles created a condition with which officials in Syracuse, as well as many other communities, were unprepared to cope.

In efforts to relieve a situation which was rapidly deteriorating, streets were widened, traffic signals and regulatory signs installed, parking restrictions established, and plans made to take the railroads out of the streets. These measures afforded no great amount of relief. In some instances, the steps taken, aggravated rather than relieved, existing conditions. The primary cause of the confusion was unfamiliarity with the basic principles governing the relief of traffic congestion. Despite protests of police officials who were endeavoring to gain an understanding of the situation, most decisions on traffic relief were made by persons who had little understanding of, and less sympathy with, the problem.

First Traffic Survey Made

The situation was eased to some extent by a decrease in motor vehicle use for several years following 1929; registrations dropping to 66,500 in 1933. When the curve began an upward climb in 1934, pressure was brought for a comprehensive traffic survey. This was started, and accomplished over a period of about two years with the aid of state and federal funds. A nationally known traffic expert was retained to supervise the survey. As a result of the survey many changes were made and much good was accomplished. In 1937, the city attained first place in a national traffic safety contest, and received a citation in 1938.

It is significant that when a new city charter went into effect in 1938, control over traffic engineering and safety work was shifted among departments with rather dire results. Traffic accidents and deaths reached an all time high, up to that time, in 1940, when 8,058 accidents and 32 deaths were reported.

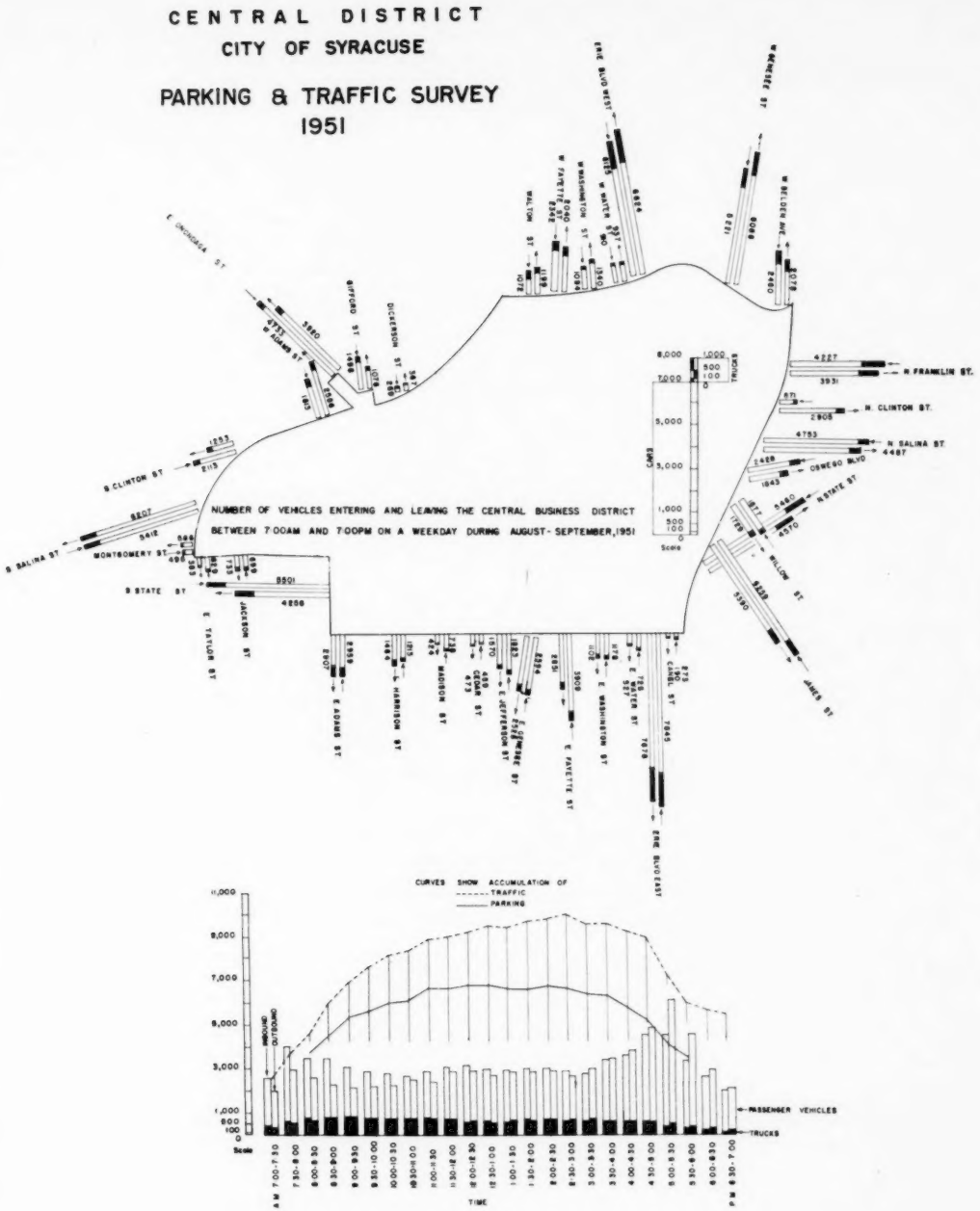
This accident and death record is particularly significant when it is considered that between the years 1935 and 1940, all crossings at grade between streets and the two major railroad lines had been eliminated by raising the tracks. Through freight movement in the city over the New York Central lines had been eliminated in the early part of the century by construction of a by-pass route, but local freight and all passenger service on this system and all freight and passenger movement on the D. L. & W. system still passed through the city. It would seem reasonable to expect that the elimination of all main line railroad-highway grade crossings would result in a proportionate betterment of the highway traffic safety record of the city. Such was not the case.

Bureau of Traffic and Lighting Established

A high rate of traffic accidents and deaths indicate, among other things, congestion, hazardous locations and inefficient controls. Realizing this, the police department and safety minded organizations started a campaign, in 1941, to secure more efficient handling of traffic engineering functions. As a result of these efforts, the mayor ordered a traffic engineering division to be set up in the Department of Engineering, in the latter part of 1942. Experience over a period of a year and a half, proved this setup to be very unsatisfactory. In July, 1944, by charter amendment, the Bureau of Traffic and Lighting was established with the City Traffic Engineer as head. Duties of the City Traffic Engineer were defined as ". . . general cognizance and supervision over the installation and maintenance of traffic signal and control devices, including devices for the control of parking on city streets and public places. He shall be charged with the duty to supervise the installation and maintenance of such traffic signal and control devices; to conduct engineering analysis of accidents and devise remedial measures; to conduct engineering investigations of traffic conditions and to cooperate with other city officials and citizens in the development of ways and means to improve traffic conditions; to conduct engineering studies and investigations and make recommendations as to the general design of roadways and pavements on city streets as to widths, intersection layout, center parkways or other traffic separators, safety islands, intersection channelization and other factors affecting the safety of pedestrian and vehicular traffic; he shall have general cognizance, direction and supervision over the planning, laying out and detailing of the lighting by the city, or by any public utility company operating within the city, of its streets, highways, parks, parkways, sidewalks, public places and public buildings; and over the enforcement and performance of city lighting contracts. He shall have such other powers and perform such other duties as may be prescribed by law or ordinance of the Council."

The charter amendment had the effect of removing the traffic division from the Department of Engineering and setting it up as a separate unit of the city government responsible directly to the Mayor. Authority over traffic control was delegated to the City Traffic Engineer by the Common Council generally as indicated in the Model Traffic Ordinance, with some minor differences.

The new bureau started off with the advantage of having the information and recommendations of the 1934-35 survey previously referred to; also the results of a city-wide traffic count taken by the City Planning Commission in cooperation with the police department in 1941. In 1943, the Syracuse-Onondaga Post War Planning Commission was set up by cooperation between the city and county governments. The City Traffic Engineer was named as traffic consultant to this group. A large amount of valuable information pertaining to street and highway conditions and traffic movement was gathered in the course of surveys connected with the activities of this group. In 1946-47, the State of New York in conjunction with local planning groups made surveys and issued a report concerned with arterial highways in the city and their connection with the proposed cross-state thruway which will pass within a half-mile of the city at its nearest point. Additional traffic surveys and counts were made by the Bureau as circumstances and finances permitted and in



INBOUND AND OUTBOUND TRAFFIC MOVEMENTS AND ACCUMULATION OF VEHICLES BY 1/2 HOUR PERIODS

CORDON COUNT

Fig. 2
Diagram Summarizes 1951 Cordon Movement and Accumulation Facts.

1951 a comprehensive traffic and parking survey in the downtown area was undertaken under authorization of the Common Council.

Information gathered in these surveys has been of inestimable value in guiding the Bureau in its work. Some details of this information and of the work accomplished by the Bureau are given in the paragraphs that follow.

Mass Transportation Improvements Plan

Motor buses were first used as an auxiliary to street railways in mass transportation in the early nineteen twenties. Continued increase in use of these vehicles along with trolley cars, coupled with increased use of private passenger cars and freight trucks resulted in conditions approaching chaotic on some main arteries. This condition was relieved to some extent when the local transit company was authorized to substitute motor buses for trolleys on all its local and suburban lines. This substitution was accomplished early in 1941. Previous to this date, all interurban electric railways had been replaced by motor bus lines.

Growth of the city has been generally to the east and south. The location of the downtown business district has not changed since it was first established in the early days of the village of Syracuse. This has resulted in its off-center position, toward the northwest corner of the city. Regardless of this, all but a few of the primary traffic arteries run through the business district, and all of the local, suburban and interurban transit routes run into this district, resulting in some streets being badly overloaded with transit vehicles during the peaks. To relieve this condition, negotiations are under way with operators of transit systems to reroute bus lines, and plans have been made for construction of a system of arteries to by-pass the downtown district.

Street Lighting

A survey of the street lighting system in 1945 revealed that the system contained 8,082 units, 4,601 of which were on wooden poles with overhead wiring, and 3,481 with underground feed most of which were supported on iron poles. Of the 4,601 fixtures on wooden poles, 2,000 were of obsolete type. There were 385 twin, magnetite arc lamps, and 667 single, magnetite arc lamps in the system, mostly in the downtown area. In the past five years, all of the arc light sources have been replaced with incandescent lamps. In the downtown area, the arcs were replaced with twin 15,000 lumen lamps supported on poles of sufficient height to place the light source thirty-two feet above the pavement, giving a light intensity on the pavement averaging between 2.5 and 3.0 footcandles. 1,300 of the 2,000 old lights have been replaced with modern fixtures and 1,000 units have been added to the system. A large percentage of the streets now have lighting that conforms to I. E. S. Standards. Previous to making the change in the downtown streets, a trial installation of mercury vapor lighting was placed in several blocks. It did not prove satisfactory.

Traffic Signals

In 1943, the traffic control signal system consisted of lights at forty-five intersections in the downtown area and eighty-five intersections in outlying districts. The downtown lights were all controlled from one timer. Only simultaneous operation was possible. In the outlying districts, all timers were of obsolete types, no interconnection being possible. In 1946, a program of improvement of the signal system was inaugurated. Controllers were installed at most intersections in the downtown area and new cable placed, having a sufficient number of conductors to allow a semi-progressive flow of traffic. The layout of the downtown street system does not lend itself conveniently to a progressive flow. Existing standards were replaced with vertical standards with double signal faces; a standard on each corner of an intersection. The controllers are of the double or triple dial type and action is synchronized by a master controller in the shop of the bureau. Duplicate master controllers are used so that in case of failure of one, the other can immediately be put into action. In the outlying districts, modern controls were installed at all intersections, single, double or triple dials being used as estimate of future conditions warranted. All cable was renewed, and signals in series were interconnected. At seventy per cent of the intersections in the outlying districts, signals were relocated for better visibility. This work is still in progress. Signal lights have been installed at seventy additional intersections. At six of these intersections, signals are traffic actuated. The traffic signal system now consists of lights at fifty-six intersections in the downtown area controlled by fifty timers all of which are kept in step by the master controller; and lights at one hundred forty-four intersections in outlying districts.

Parking

A series of studies of off-street parking lots were made for the local parking authority. Two lots were developed by the bureau for this authority. One lot had a capacity of 300 cars, the other 210 cars. Both were operated by the bureau. The larger lot has passed to private ownership. The other is still under municipal operation.

Based on the findings of the traffic and parking survey made in 1951, starting early this year parking was banned on downtown streets between the hours of 4:30 P.M. and 6:00 P.M. Results in increasing efficiency of streets was very gratifying to drivers. Some downtown merchants seem to be unhappy about it.

Channelization

Islands for protection of pedestrians or to channelize traffic have been installed at seventeen intersections. Such islands are first formed temporarily with standards and if proved successful are constructed of concrete with steel curb. Permanent islands have been placed at six locations.

The bureau has cooperated with the City Planning Commission and the State Department of Public Works in surveys and preparation of design for a system of arterial highways to relieve the loads on existing primary highways.

Conclusion

Efforts to improve traffic conditions seem to be bearing fruit as indicated in the reduction in traffic deaths in the last few years and in the proportionate reduction in traffic accidents as compared to vehicle registration. For the past several years the city has held high place in national traffic safety contests, and in the past three years it has held one first and two second places in Traffic Engineering.

Major Problems of Transit Operations Related to Traffic Engineering

By John B. Ecker (Mem., ITE)

Assistant to President, Capital Transit Company, Washington, D. C.

THE problems of urban growth and development have been with us for many years, in fact they were acute even before the War. Since the War they have been accentuated and there is now a greater appreciation not only of the importance of the problem but of general methods of dealing with it. Our Nation is becoming more and more urbanized and with it many problems which did not exist in the past have developed.

About the end of the War an estimate was made by the Census Bureau in which it was anticipated that about 38% of the larger urban areas would hold their population gains which, in most cases, were tremendous and that about 54% would stay stable, that is at least not drop back to pre-war levels. These were conservative estimates. The 1950 Census revealed that our urban areas have developed at a much greater per cent.

Decentralization

Normally, in the past, with the gradual increase in population of urban areas, the central business district has improved in value. However, in the last decade or so, because of decentralization, we have now gotten to a point where central areas are suffering material losses in property values. These areas constitute at least one-quarter of the City's taxable property and yet only cover approximately one per cent of its area. It can be understood readily, therefore, the importance of this area from a revenue producing standpoint. In addition, there are many conveniences which exist in the central areas which cannot be supplied in outlying areas, such as, mutual interests of banking, retail and theater districts, etc. Cities are faced with additional outlays of a capital nature as well as greater normal annual operating costs in covering larger areas with a smaller tax base as a result of relocated and dissipated facilities. With the flight of business to outside areas, many cities are confronted with tax problems affecting their budgets since they cannot recoup the taxable gains from development outside their corporate boundaries. Furthermore, the dollar to meet these problems is approximately one-half the pre-war dollar in purchasing not only capital improvements but defraying increased cost of the expanded operating expenses. As a result, most cities are having a difficult time meeting these budgets.

Along with these capital needs there have been expanded police and fire protection, maintenance of water, sewers, highways and increased number of school teachers. Our City Fathers have to take all these problems into consideration in their annual budget as well as just purely traffic problems with which you are primarily concerned. I refer to these needs because it is obvious that we must find ways and means to solve our traffic problems at costs which give consideration to over-all budgets for all necessary expenditures.

Increase In Automobile Registration and Use

The number of automobiles in urban areas since the War have increased tremendously. The mileage increase, or traffic use of these automobiles, has been at even a greater rate.

With the benefits from the increased use of the automobile there have come correspondingly serious problems. Foremost among them is traffic congestion. This traffic congestion is forcing on the cities not only temporary but also permanent improvements of a very costly nature relating to both enforcement and construction. The inaccessibility of the facilities in the downtown area is driving business to other places. Parking problems of both the all day and short time parking has become acute.

Problems of Transit Decentralization

The same problems affecting the city's development have had a tremendous influence since the War upon transit operations. Decentralization in itself involves a loss of traffic as other areas developing outside of the centralized business district area are more accessible to the automobile and able to provide more readily parking facilities. This redevelopment works against the improvement of transit services since the greater the distribution (spreading out of these business areas) the greater the increased cost of service; more route mileage, more mileage per capita, and the smaller proportion of persons using transit.

Increased Registration of Automobiles In Use

The increase in automobile registration and the even greater increase pro rata of use have resulted, naturally, in the loss of transit passengers. The increase in congestion has stimulated the further loss in passengers because of less attractive service. The cost of this service has increased because of slower speeds due to congestion. As a result of diminishing patronage, it has been necessary to lengthen headways of transit service which curtails the frequency. This results in stimulating further reductions of patronage. Related also to increased automobile ownership and use since the war are greater demands for parking facilities. Most parking programs are keyed to caring for short time parking in order to maintain the integrity of the central business district. This policy is followed primarily for two reasons, (1) because it is felt the workers have to get into the central business district whether they like to or not, but that the shoppers can elect as to where they go and it is thus necessary to improve the accessibility in order to attract patronage and (2) because the profit from handling short time parkers is much greater than long time parking. The turn-over is greater; and the customers for a short time are willing to pay proportionately a larger parking fee for the use of the space involved, if convenient.

Costs of Transit Operation

Transit, like municipalities, is faced with increased costs of capital for replacements as well as new equipment. The transit companies have purchased large quantities of rolling stock since the War. However, a large number of new units are still needed and reserves have to be set aside for the purchase of further equipment. The cost of this equipment is materially above the cost of equipment which is replaced. For example, a large passenger bus costing about $10,000 prior to the War is now nearly twice that. Other capital items are in the same relative proportion. Depreciation is, however, set aside on the basis of original cost and, therefore, in cases where equipment has increased materially in price, surpluses have to be drawn upon or supplementary funds secured from outside sources. Surpluses naturally are not available unless set aside from earnings in previous years. Material and supplies have increased in proportion to material and supplies with other industries. Labor rates have probably increased at higher proportions. In operators' rates this only represents a portion of the story since there is approximately 30% in excess of vehicle hours as far as service to the public is concerned to cover hours paid operators. Items making up these additional costs are meal allowance, spread allowance, guarantees, travel time, overtime, sick leave, etc. In many cases labor's demands for additional pay have been granted independently of transit's ability to pay. It is needless to say, however, these costs have to be passed on to the public. The impact of any increases to labor are tremendous since labor costs account for 50% to 60% of gross revenue. It is necessary, because of increased labor demands and other costs to increase fares. However, because of a controlled rate base, conservative rate of return (not guarantee) and delays in adjustment of fare structure, transit suffers severely from the impact of upward increases in labor rates. Fare increases, universally, are delayed because of demand to show cause.

While the War was most helpful to transit companies in putting them back on their feet financially, many of them are now operating in the red. Credit is obviously adversely affected when operating losses continue. All this emphasizes the difficulty of attracting new capital and improving poor transit service.

Effect of Poor Transit Service

Now what does this lead to — certainly not improved transit service to the public. These factors all combine to influence the character of service. Reduced patronage results in lesser need of service. Increased costs do not permit of operation of service not patronized. Increased use of automobiles correspondingly results in a lesser use of transit service. The additional automobiles add congestion to the streets, thereby increasing transit running time and the number of vehicles involved and thus further adding to transit operating cost.

Increased demand of automobiles add to additional highway and parking facilities, which the city is not able to pay. Traffic congestion increases inaccessibility in the central area and acts as a spread of decentralization, which in itself is a retardation per capita of the use of transit service. Servicing decentralized areas means more route miles and a lower use per capita of transit.

It can safely be said that public or quasi-public transit operations have not solved these problems and are just as much subject to these influences as privately operated systems, in fact in most cities the public has, without being aware of it, paid an additional fare in the form of taxes to make up a deficit and/or loss in previously paid fares. The results of various surveys certainly emphasized that public transit is recognized as essential by public officials. Yet, while city officials, traffic engineers, Public Service Commissioners, etc., appreciate the importance of transit service, they lack an understanding in many respects of the problems or courage involved in maintaining the integrity of operations and the elements essential to improvement of service for the benefit of the public.

Cost of Handling Rush Hour Traffic

A large proportion of rush hour traffic is carried into the downtown area by transit service in any large city. This results in conservation of street space and also reduces needs for parking facilities.

While most public authorities agree that public transit is essential in handling rush hour traffic, many of them do not have any real concept of economic problems pertaining towards cost of this service. It is essential that there be an appropriate amount of off-peak transit traffic to provide sufficient net income during that period to offset the much higher cost of providing for rush hour service, even with greater individual vehicle loads.

One of the factors influencing costs of rush hour service is the heavy charge for depreciation of equipment. This not only applies to rolling stock but also to supporting plant and equipment. Under present conditions, the normal cost for a large bus is about $20,000. On properties where there is very little under cover storage (and this is not the case in many properties) the cost of supporting equipment, including garages, shops, tools, etc., might amount to $7,000. Fixed charges apply whether the equipment is in constant use or not. Therefore, the greater use that can be made of the equipment throughout the day and the year the better chance there is of amortizing these fixed charges, including interest and depreciation.

Another factor which has a bearing indirectly on the relative cost of operation is the servicing charge. A base bus (for example, one that is running all day long, practically five to seven days a week) will accumulate more than three times as many miles a year as a tripper bus (operating only one to three hours in one or both rush periods). In some cases a tripper bus may only get one trip a day, one in the morning and none in the afternoon or vice versa. Experience has shown this service is much more costly per mile to operate than a "base" bus over the same routes, etc. Servicing charges, including washing, gassing and many other activities have to be performed on a time basis regardless of how much mileage is operated. These charges may amount to an increased cost per mile of approximately 25% to 30%.

A similar situation exists with regard to costs for platform time of operators. Most properties' contracts with labor provide for guarantees of one sort or another per day and per week; guarantees of a certain amount from runs, overtime payments, allowances of all sorts, including meals, turn-in reports, intervening time and spread time where work is performed in swing shifts. Swing shifts are due to lack of uniform traffic loads, so that it is necessary to split work in order that an operator may be available in the heavy morning and afternoon rush periods. The cost per platform hour for tripper service varies from 50% to 150% in excess of the cost for regular runs, depending upon the factors involved.

Loss of Peak Traffic

Since the War there has been a heavy loss of patronage in off-peak periods, such as in the middle of the day, night, Saturdays and Sundays with relatively less loss in rush periods. This is probably natural inasmuch as people to a certain extent ride transit from necessity. Loss of off-peak traffic is influenced by the difficulty of handling bags, the inconvenience of non-availability of direct routes to diversified locations, the longer headways and the availability of parking in many areas. At the peak hour most people are going to some central point where parking facilities are extremely limited, or, if available, are rather high for all day costs. These factors influence a higher proportion of the load being carried in the peak and have further accentuated some of the problems referred to heretofore.

The general public, observing the heavily loaded peak hour vehicles, naturally, believes that the company profits correspondingly. Such is not the case. Most of the burden of losses occur during these periods. From the standpoint of the community, it is wise for transit to bear this burden. On the other hand, it must be recognized that from a financial standpoint it is difficult to handle these loads at prevailing fares. In many cases approximately 50% of the peak hour traffic in the morning rush occurs in one-third of that time, or the maximum hour.

Express Service Cost and Revenue

In the transit industry there are divergent views of opinion with respect to fares relating to express service. Many members of the industry, however, agree that it is highly desirable to develop express service whenever it can be justified. There are, however, some essential factors that are necessary to justify express service. In the first place, it has a psychological appeal. In order to operate express service, it is necessary that there be sufficient patronage to justify running this service in addition to local. It is also necessary to run the express service at such reasonable headways as will be attractive. However, because of the wider headways required under such circumstances and the limited period in the rush during which they are operated, it is frequently only possible to get one trip out of a bus. It is readily obvious what effect such conditions have on the cost of the service. Thus, there is justification for premium fares on express service not only from a cost standpoint but also because of preferential value of such service. However, since the service is an improvement over that already offered, new, additional passengers probably will be attracted, adding to the cost involved in operating rush hour service because of the factors previously commented upon.

Fringe Parking Lots

There have been numerous experiments with fringe parking lots. These have been related to serving both peak and off-peak traffic. They have also been located on the outskirts as well as adjacent to the business district. It is questionable whether any of these experiments have been economically successful. The primary reason for failure as related to serving the short time parker is that people do not wish to make a transfer from auto to bus in order to do their shopping in the central area. If that is necessary, they would just as soon park on the street, exclusive of parking charges, and board a more frequent regular routed bus. Much of this type of parking is already taking place, not only in off-peak but also all day. There are, however, some possibilities of developing fringe parking lots for peak auto traffic. These lots would vary in location from reasonably close to the downtown area to some distance, depending upon the running time from the lot to the downtown area. For example, a subway system, giving short running time to the downtown area would permit such a lot much further from the downtown area than otherwise. On the other hand, if lots are served by surface lines, they will have to be relatively near to the downtown area because of the running time under those circumstances. This should encourage the use inasmuch as it gives the patron an opportunity to take advantage of an automobile ride for a goodly part of his distance. Once he gets into the congested area, he cannot travel very much faster than transit anyway. (As a cost factor, these lots should be far enough out where the land price would be low enough to permit the parking facilities at a charge which would not be prohibitive.) The shorter ride on transit would be advantageous to transit operations in that it would reduce the length of haul, allowing more round trips with the same equipment and the possibility of more frequent service.

In many communities there is agitation for both improved transit service and improved off-peak parking facilities without realizing the problems involved. Improved transit service economically self-supporting, cannot be accomplished if the over-all cost of transit service is to be increased in the rush periods and its revenue reduced in the off-peak by shifting off-peak transit patronage to autos by providing convenient parking facilities in the downtown areas (self sustaining because of frequent turnover) and by shifting peak hour automobile patronage to transit operation. Such proposals further disturb the uneconomical ratios already in existence.

Development of Cities

Controlled decentralization, such as relocation of employment areas which tends to balance transit inbound and outbound loads is helpful. The development of appropriate by-pass highway and transit routes will also facilitate movement by eliminating from congested zones unnecessary traffic and permitting more direct and attractive routing. Studies have shown this to be potentially as much as 25% to 50% of the total involved in the central area.

Suburban Development

The tremendous development in the suburbs of all of our large cities has created a problem transit has not been able to cope with economically. The more extensive coverage requires additional service and route miles, while the availability of local parking facilities stimulates the use of automobiles. The limited use of transit facilities does not justify more frequent service or additional routes. All factors tend to make it more and more difficult to render transit service that will even hold present patronage in these areas and they are becoming proportionally a larger part of our cities.

Full Appreciation of Problem Required

The problems which have just been outlined, having a bearing on the financial results of transit operation and vitally interrelated with urban growth and development, must be solved if transit is to exist as a vital factor in serving the community needs and demands. Ignorance of the effect of these factors or intentional misrepresentation of them can only lead to further loss to the community. An intelligent understanding and full appreciation is essential by all parties involved, including professional men, municipal, state and federal government servants and civic leaders.

Common Interests of Automotive and Highway Engineers

By Charles A. Chayne

Vice-President — Engineering, General Motors Corporation

This timely paper was presented to the 43rd Annual Meeting of the Mississippi Valley Conference of State Highway Departments at Chicago, March 7, 1952. Mr. Chayne is a member of the Society of Automotive Engineers, and Chairman of the Engineering Advisory Committee of the Automobile Manufacturers Association.

IT is a great pleasure to meet with you, because I am conscious of a strong bond of common interest between us. In fact, there is no group, except automotive engineers, to which I feel professionally closer than to you who plan and build our highways. And I am sure that other automotive engineers share this feeling.

You and we have the common, important objective of giving America a kind of mobility that everyone in this country wants and needs—the unmatched freedom of movement provided by highway transportation. This mobility has already contributed immeasurably to social and economic progress, as well as to national security. In fact, it has become such an integral part of the fabric of our national life that we are critically dependent upon it. We are truly a "nation on wheels," and our future well-being demands that we keep the wheels rolling smoothly.

We in the automobile industry naturally take pride and satisfaction in our part in the development of modern highway transportation. But we know that we haven't done the whole job. We have provided the wheels, but the wheels need roads.

I want to take this opportunity to salute you highway administrators and engineers for your achievements—made in the face of great obstacles—in the development of our highway system. There is great concern, and rightly so, about the present inadequacy of much of our highway system, but the fact remains that you have given America the world's finest roadnet in an amazingly short time. You got us out of the mud and I am confident that you will get us out of the muddle, just as fast as you can get the money, the materials and the support you need to do the job. The limited mileage of modern design roads already in service and the plans you have drawn show clearly that you know what needs doing and how to do it.

I am sure that all America appreciates what you have done and are doing. Certainly, we in the automobile industry do. As engineers and as businessmen, we want our products to have public appeal and utility. We know that unless you provide a favorable environment for their operation, our cars and trucks will be about as useful as a canoe in the desert. And as good citizens, we know that adequate roads are essential to our country's well-being.

There is thus adequate basis for a feeling of common interest between automotive and highway engineers. But you and we must have more than a common interest. We must have a working relationship geared to our common objective. Otherwise, both our jobs will be more difficult—and less successful.

Highway and Vehicle Is Integral

In terms of the end product, we don't provide just motor vehicles and you don't provide just roads. Actually, we are both providing *transportation*. The components which each of us designs and builds won't work well together if we are isolated from each other—any more than we could build a good car without coordination between stylists and engineers or you could build a good highway without coordination between design and construction engineers.

Highway transportation has worked as well as it has because there has been a measure of coordination between us. In the early days, we worked side by side in good roads campaigns. Throughout subsequent years, we have often collaborated on technical problems of mutual interest. An example of this has been our joint participation in projects of the Highway Research Board, such as the Maryland road tests and the work of the Committee on Vehicle Operating Characteristics.

But highway transportation can work a lot better if we develop more coordination. From the standpoint of our industry—and I am sure you feel the same—this coordination must be evidenced in two areas. First, we in the automobile industry must express an active, constructive interest in public policy on highway development. Secondly, automotive and highway engineers must maintain close liaison on all technical matters of mutual concern.

Speaking strictly as an engineer, I am, of course, particularly interested in the latter area of coordination—technical liaison. However, I realize fully the importance of our industry's concerning itself with the broader aspect of highway planning and finance. After all, in this, as in other fields, technological progress is governed not only by engineering skills but also by administrative policies and financial resources.

Recognition of this by automotive industry management is indicated by the support being given to sound highway development programs. Our industry is neither indifferent to the basic highway problems confronting the nation nor is it merely adopting a passive "view with alarm" attitude. Rather, it is trying to participate in remedial action as fully as is possible and appropriate.

Cooperation With Highway Agencies

Through the Automotive Safety Foundation, which we support in cooperation with allied industries, we offer specific

technical assistance to official agencies. Through the National Highway Users Conference, in concert with other interested and affected groups, we seek to develop strong and united support for sound highway policies. And through supplementary action by individual companies we seek to enhance the effectiveness of both of these agencies' programs.

An example of such supplementary action is General Motors' current program to stimulate broader public interest and action with its film and booklet entitled "Let's Get Out of the Muddle." This presentation, which I believe many of you have seen, is aimed both at our own dealer organization and civic groups in general. It stresses the importance of highway transportation and the need for good roads, analyzes the deficiencies of our present highway system and the reasons for their development and urges greater public support for an adequate and wise expenditure of public funds to get the roads we need. Released last fall, the presentation has already been seen by several hundred thousand persons and interest in it is still mounting. Most important, there is already evidence of constructive action stimulated by it.

In addition to helping build general public support for sound highway policies, our industry has joined with other groups on many occasions in vigorous campaigns to combat specific threats to the healthy development of highway transportation. A current instance is the campaign being carried on through the National Highway Users Conference to impress federal defense agencies with the essentiality of highway transportation and the importance of steel allocations adequate to meet critical highway construction needs.

We hope and believe that these varied activities will help get the modern roads that modern traffic needs. As I said earlier, we have confidence in your engineering ability to plan and build such roads. The lack of enough of them stems largely from factors beyond your direct control, such as dispersion of funds, wartime neglect, inflation and, of course, the tremendous postwar increase in motor vehicle registrations and travel.

As one phase of our share of the responsibility for a coordinated effort to improve highway transportation, we shall continue our aggressive support of a policy of adequate and wise investment in highway maintenance and construction. Such action is, in our opinion, a logical extension of the interest in safe, efficient highway travel which we constantly display in designing and manufacturing motor vehicles.

Technical Liaison

Concurrently, we are equally interested in working with you to enhance coordination in the second area—technical liaison between automotive and highway engineers. Such action offers great promise as a means of promoting more rapid and better balanced progress. Naturally, there is much that we can do quite independently of one another to increase safety, comfort, operating economy and other elements of highway travel. But in many cases the public can be benefited only by coordinated study and action—and in almost every case the benefits can be greater if such an approach is followed. The matter of night visibility is an example. Vehicle lighting and road lighting ought to be studied together in the interests of arriving at the best solution to problems presented in this field.

Four things seem to me to be necessary to make such coordination work:

1) Mutual consciousness of the need for coordination
2) General familiarity with each other's methods and problems
3) Joint study of problems of mutual concern
4) Free exchange of pertinent information.

These can be achieved only if our working relationship is reasonably formalized. Our experience with the state motor vehicle administrators through the Engineering Advisory Committee of the Automobile Manufacturers Association indicates this. For example, the coordinated action taken through this agency greatly expedited the introduction of the sealed beam headlight and has facilitated joint study of further improvements in the sealed beam unit as well as of proposals for polarized headlighting.

Following a series of informal discussions on the desirability of such a relationship on highway matters between the American Association of State Highway Officials and the Automobile Manufacturers Association, definite steps were recently taken to create the necessary machinery. The AASHO has designated a committee to maintain necessary liaison and the AMA has matched this action by setting up a special subcommittee of the Engineering Advisory Committee. This industry group includes representatives of both car and truck manufacturers and also a representative of the AMA's Highway Policy Committee. It will deal with all engineering matters of joint interest to the industry and the highway officials, taking over certain matters now charged to other AMA committees.

It is naturally too early to indicate specifically just what will be the scope and character of the work that these liaison committees will do, but I am confident that they will serve a highly effective purpose and give real substance to the concept of coordination.

Commercial Vehicle Design Problem

Coordination is obviously vital in the matter of large commercial vehicles because of the intimate and critical relationship of their weights and dimensions to the maximum capabilities of highways and bridges. Equally obvious is the need for more facts on issues in this area as a basis for sound, coordinated action.

The recent Maryland tests and those proposed in your region and elsewhere on the relation of axle loads to highway condition indicate that progress is being made. When conducted in a realistic, objective and efficient manner, such tests merit the support of all affected groups.

Some have questioned the Maryland test methods and findings. However, all concerned should recognize that this was somewhat a pilot study, designed to produce some partial, tentative answers and—equally important—to point the way to improved further tests. Mistakes were probably made, as they often are in the early stages of any research, but the really significant thing was that this project marked the start of a conscientious, cooperative effort to substitute facts for opinions in an important area. As such it was heartening evidence of the kind of coordination I urge. Such coordination certainly does not bar honest, constructive criticism or even sharp disagreement as work progresses, but it does demand that everyone involved or affected subordinate lesser considerations to the ultimate objective of a sound, workable solution.

There must also be similar action regarding other commercial vehicle problems, such as performance on grades. Such an approach is clearly preferable to one under which one group says "cut down the grades or widen the roads" and the other says "increase hill climbing ability."

There are other important areas of mutual concern which affect both trucks and passenger cars in terms of performance, economy of operation, freedom of movement and, above all, safety. We should get together frequently for a long look at the future. You, for example, will want to know such things as our estimate of future production, the trend of maximum vehicle speeds, vehicle dimension and road clearance trends, possible developments in headlighting and others.

Your familiarity with such matters as these will certainly help you in your planning. It will often also better equip you to reach sound conclusions on issues relating to automotive design and regulation which may arise in your own states and on which you may be consulted. Because, as I know you fully recognize, your own work is inescapably tied up with everything affecting highway transportation, I believe you will properly be interested in such issues even though they may not relate directly to highway administration. For example, I believe you should know our industry's position, and the reasons for it, on such matters as polarized headlighting and speed governors.

I mention these two in particular because of their importance, the great amount of controversy they have provoked and the misconceptions that are current regarding them. Time does not permit an exhaustive discussion of these subjects here, but I should like to mention a few highlights of the basis of our position.

Polarized Headlights

Regarding polarized headlighting, the automobile industry decided against its use at this time after long and careful study of all pertinent factors, conducted in close cooperation with the American Association of Motor Vehicle Administrators. Please note that I said "at this time." We are fully conscious of the important merits of the system as a means of reducing glare and improving night vision and we have not closed the door to possible future consideration of this system of headlighting. We simply do not think it is practicable or in the public interest to introduce it now.

Our principal objection relates to the serious problems which would develop during the transition period from present to polarized headlighting. The benefits of the polarized system depend upon its practically universal use, but no workable plan for rapid conversion of the lights on the more than fifty million vehicles now on the road has been devised. There would thus be a long period of mixed use during which glare would be a far worse annoyance and menace than it now is. A study made recently in one state indicates just how serious and prolonged the mixed-use problem would be. It was determined from study of registration records that if the polarized system had been installed in all new cars for a period of five years, only about half of the cars registered in that state would be factory-equipped with such lighting. This would mean that only about 18% of the meetings between cars at night would be between those equipped with polarized lights. Another 18% would be between those with conventional lights and about 64% would involve the hazards of mixed lighting.

There are also several technical problems involved in the adoption of the system, due chiefly to the greatly increased generating capacity required and the need for a separate system of conventional lights for city use. These problems are by no means insurmountable, but they do involve equipment and design changes and increased costs which must be weighed against the immediate benefits to be expected. It is quite possible that there would be strong public opposition to paying up to $100 or more for every new car to buy a lighting system which would not produce marked benefits for several years. Even after five years, during which a typical car owner would have paid $225 extra for polarized lights—assuming a unit cost of $75 and the replacement of his car at two-year intervals—he would be benefited in less than one-fifth of his meetings with other cars at night. If you are interested in totals—during this five-year period in the one state studied, the buyers of new cars would have paid more than $50,000,000 for this equipment.

Those of you who may be interested in further data on this subject can obtain it readily from the Automobile Manufacturers Association.

While we have tabled this project for now, we are, of course, continuing our studies of various means of headlighting improvement as an inherent, important part of our over-all research and development work aimed at ever-better motor vehicles. Our vital interest in this subject is evidenced by the great amount of cooperative work that went into development of the sealed-beam headlight. And we have by no means stood still in the years since its introduction. Several refinements have been made in this unit and others are now under study. We are hopeful, for example, of presenting this spring a new and greatly improved lower beam design for the approval of the state motor vehicle administrators.

Speed Governors

As for speed governors, we are firmly and unequivocally opposed to the universal installation of such devices as a supposed safety measure. We are as concerned as any group about the serious toll of traffic accidents—and just as aware of the important extent to which driving at excessive speeds aggravates this toll. However, we believe that mechanical governors would not only fail to curb the reckless speeding problem, but would actually create new hazards.

Three primary considerations support these beliefs. First, most authorities agree that speed is an accident factor chiefly in terms of speed too great for conditions rather than simply very high speed. It is unlikely that any limit to which cars could reasonably be held by governors would eliminate much of the dangerous speed problem. Secondly, governors would rob cars of much of the accelerating ability which is now often a distinct safety factor, notably in overtaking and passing. Thirdly, the fact that governors are not tamper-proof would pose enforcement problems of an almost insurmountable nature. It should also be noted in this connection that presently-available types of governors cannot be held to a specific maximum speed; there may be variations of 5 to 10 miles an hour either way.

Governors would not only afford no measurable increase in highway safety, but would be an added financial burden on motorists in terms of initial cost, increased service charges and decreased fuel economy.

The periodic agitation for speed governors is typical of the many impractical suggestions for gadgets or design

changes in the supposed interests of safety which automobile manufacturers receive or which are aired in public. Those who make such proposals are usually well-intentioned but technically uninformed. Many of these proposals are simply incapable of practical application. For example, it has been suggested that the front bumper be designed to absorb most of the shock in a collision. The fact is that to accomplish this at even a few miles an hour the bumper would have to extend several feet ahead of the car. Other proposals, such as that the engine be placed in the rear of the car, would actually make driving more difficult and would often decrease protection of occupants in collisions.

I don't mean to imply that we alone know all the answers, but those who are tempted to be amateur automotive engineers should realize that this is certainly one field where a little knowledge can literally be a dangerous thing. I also want to assure you that our interest in such matters is not merely a negative one of rejecting unsound proposals. Automotive engineers work constantly in laboratories and on proving grounds to increase the safety of car and truck design. In General Motors, for example, we have a special committee of engineers from all our automotive divisions that concerns itself exclusively with design safety.

Trends In Automotive Design

Regarding general trends in automotive design and performance, you may be interested in some of our current experimentation, as reflected by the design and performance characteristics of the Buick XP-300 and GM's "Le Sabre." All automobile manufacturers are, of course, engaged in long-range development work. I refer to these particular experimental cars only because of my understandably greater familiarity with them.

These two cars were built to study a number of very advanced design features. They incorporate, for instance, weight distribution and suspensions designed to provide better ride and much safer handling characteristics under extreme conditions. This is one reason why the cars were provided with engines capable of driving them, for test purposes, at speeds far in excess of what you or we ever expect to see in production cars. When we study handling characteristics we have to know if a car will behave properly throughout its speed range or whether its behavior will undergo a pronounced change with an increase in speed of only a few miles per hour.

Since we wanted engines capable of providing such speeds, we took advantage of the opportunity to study some very advanced features of engine design and provided supercharging to stress the engine parts to the utmost. Once again, to determine limitations.

We built the cars very low to determine whether there may be any serious disadvantages in an extremely low position of driver and passenger. That point I am sure you will appreciate is always being debated in our business.

Once we decided to build the cars, we thought we should dress them in ultra-modern styling and incorporate a number of experimental features for the comfort and convenience of the driver and passengers.

I cannot say when or how fast some of the features of these cars will be adopted on standard vehicles but there is no question that such experimental cars represent at least a general preview of many things to come.

Automobile design is not static—such things as automatic transmissions, high compression engines, sealed-beam headlights, heat-absorbing window glass, power steering and other recent innovations will be followed by other advances just as surely as they in turn followed the self-starter, four-wheel brakes, safety glass, steel tops, and synchro-mesh transmissions which were once "the last word."

Whatever the cars of the near future may be like in appearance, equipment and performance, I don't think they will give you any great new cause for concern about highway design. They won't be amphibious, or twice as wide, or designed to cruise at 200 miles an hour!

Major advances are likely to be in the area of ease of control and efficiency of engine performance. Their drivers will want highways improved, but for the same reasons and to about the same extent as do the drivers of today's cars.

Need for Information

The flow of information about engineering plans must, of course, be a two-way proposition. We are as interested in the roads of the future as you are in the cars of the future. We should like to know such things about your plans and thinking for tomorrow as the kinds of paving materials that will be used, proposed design features such as lane widths, curve radii and grades, curb and pavement edge design, highway lighting and design speeds of highways.

Another kind of information which you can provide to us and in which we are vitally interested is that pertaining to motor vehicle use and traffic behavior. Highway department studies on these subjects are no less important in designing motor vehicles than in designing roads. Typical of the many facts in which we are interested are prevailing speeds, distribution of travel by types of roads, purposes of trips and traffic volume trends.

Our joint interest must also extend further into the field of the human factor. The design of both vehicles and highways must give increasing attention to the capabilities and habits of the people who use them. Both you and we have, of course, studied this, but we can profitably increase our attention to it—and we can do the best job by working together on matters of mutual concern. An important example of the need for study in this area is the apparent tendency of many drivers to become less alert and competent after driving for relatively long periods on modern freeways.

Future progress in automotive transportation will be determined to an important degree by the extent to which you and we work together—not invading, not ignoring the other fellow's field, but rather complementing it. The vehicle and the road are parts of one thing: *highway transportation.* This form of transportation can be the finest in the world if we treat its parts as essentially a whole. It isn't a matter of deciding whether to fit the car to the road or the road to the car. It's a matter of fitting both to the needs of society. The more we work together with this in mind, the more the public interest will be served.

Warrants for Right-Turn Arrows

By Roger E. Kuehl (Jr. Mem., ITE)

Assistant Traffic Engineer, City of Kansas City, Kansas City, Mo.

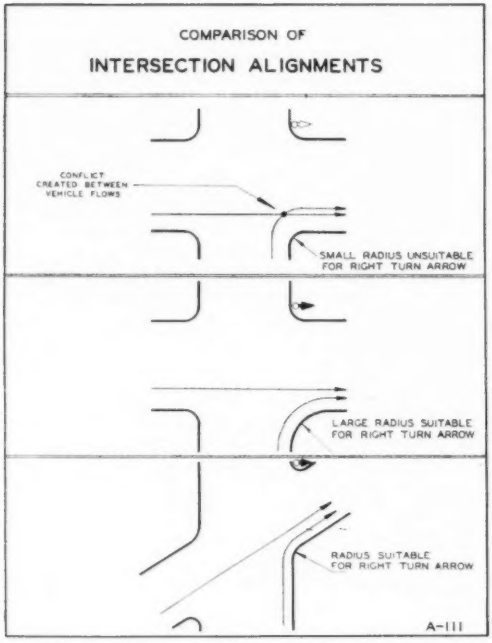

COMPARISON OF
INTERSECTION ALIGNMENTS
CONFLICT CREATED BETWEEN VEHICLE FLOWS
SMALL RADIUS UNSUITABLE FOR RIGHT TURN ARROW
LARGE RADIUS SUITABLE FOR RIGHT TURN ARROW
RADIUS SUITABLE FOR RIGHT TURN ARROW
A-111

Fig. 1

IN order to cope with the ever increasing volume of vehicular movement, traffic engineers have whole-heartedly adopted any reasonable means of control which encourages more efficient use of a street network designed for the horse and buggy. One such method of control which is becoming quite popular is the so-called "right-turn arrow." Although the nomenclature may vary throughout the country, the principle is that vehicles may make a right turn against a red signal upon illumination of an additional signal face which most commonly shows a green arrow indicating the direction of the permitted turn. In the past, such installations have been made purely on the basis of judgment and experience, since so far as we know, no true warrants exist. In an attempt to be able to analyze the right-turn arrow from a factual standpoint rather than relying exclusively on judgement, a study has recently been undertaken in Kansas City with a view to establishing factual warrants for the installation of signal control that permits right turns to be made continuously.

The right-turn arrow on a red light, when properly installed, is unquestionably beneficial to vehicular traffic. There is no doubt that more approaching vehicles per cycle can be dispatched through the use of a right-turn arrow than without, due to the continuous usage of the right lane for right turns. Moreover, the installation is extremely popular with motorists. These facts would seem adequate reasons for the installation of right-turn arrows at every intersection where physical conditions permit, i.e. where curb radii are large enough to permit the merging at small angles of the right-turn with the through traffic from the cross street green light. Figure 1 points out the general alignment of the type of intersection which would permit a right-turn arrow installation. It is readily apparent there are many intersections which, by virtue of their physical characteristics alone, would merit right-turn arrows. But it must be remembered that these facts pertain only to *vehicular* flow and ignore completely any consideration of pedestrian traffic. Upon closer examination of the right-turn arrow and its effect on vehicles *and pedestrians*, a great many other factors enter in, some of which are not immediately apparent.

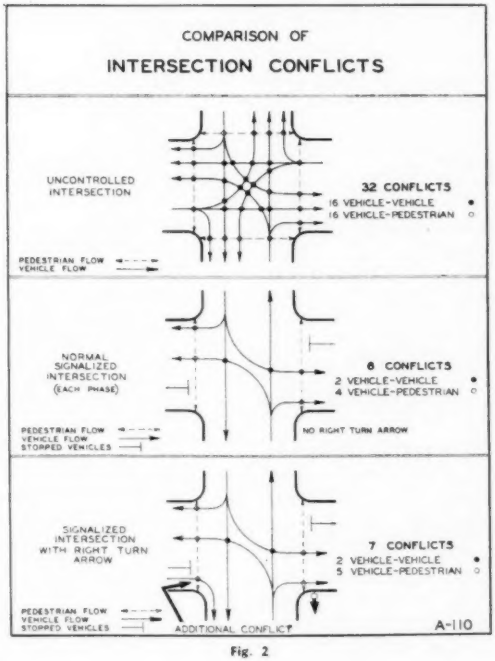


Fig. 2

Most imporatnt is the fact that the use of a right-turn arrow *legally sets into* direct *right-angle conflict* a vehicle stream and an opposing pedestrian stream. This is *absolutely contrary* to a basic principle of signalization, that of attempting to separate rather than create points of conflict. During any one phase of normal two-phase signal control with all turns permitted and no right-turn arrow, six right-angle conflicts are created, two of which are between vehicle streams, and four of which are between a vehicle stream and a pedestrian stream. Figure *II* makes this clear. These six conflicts compare with a total of 32 conflict points at an uncontrolled four-leg intersection, 16 of which are between vehicle streams, and 16 between pedestrians and vehicles

The installation of a right-turn arrow on one approach *creates* an additional right-angle conflict between legally crossing pedestrians and legally proceeding autos. A pedestrian who normally has to contend with two streams of vehicles, is faced with *three* vehicle streams if he attempts to cross against right-turning vehicles. Two of these streams normally move against pedestrians at any signal and the existence of the resulting conflicts is commonly realized by and allowed for by both drivers and pedestrians. But the additional paths of conflict created by a right-turn arrow are not only at right angles, but the conflict is of a type not ordinarily imposed on pedestrians; consequently, users of the crosswalk are understandably surprised by its occurrence. It is expecting a good deal of pedestrians to assume they can watch and evaluate three vehicle streams each approaching from a different direction, and remain calm and unruffled. Certainly, it can be said that if right-turn arrows find favor with drivers, they are unpopular with traffic's "forgotten man."

Certain other observed features of the right-turn on red make it an inherently hazardous operation. For example, although such a turn should be made with extreme caution, it is well known that many drivers exhibit no more caution when making such a turn than they do when proceeding on a normal green light. Although the accepted meaning of a green arrow is that drivers *may* make the indicated turn if they do not interfere with either pedestrians or vehicles on the cross street, it is all too clear that many drivers interpret the green arrow to mean they *must* make the turn, which is not the meaning of the arrow at all.

Another hazardous feature of the right-turn arrow arises directly from the fact that only intersectional approaches having large radii are suitable for arrow installations. These large radii permit free-flowing right turns to be made with ease and comfort, from the driver's point of view. The ease of turning will enable a driver to make the turn at a greater speed than he normally could, and the result is a doubled hazard to pedestrians. Not only will a pedestrian be subjected to an additional vehicle stream if he crosses against right turning traffic, but this extra stream will be directed at him at a greater velocity than the speed of the vehicles that normally oppose pedestrians at any signalized intersection.

This discussion should not be interpreted to mean that right-turn arrows should never be installed under any circumstances, but that extreme care and a thorough engineering analysis be made before installation. There are a number of circumstances under which turning arrows should not be erected. Certainly one of them is when the accumulation per cycle of right-turns can be handled by a normal green light only. In the interests of pedestrian safety, it even appears logical to tolerate a certain amount of over-accumulation of right-turns, especially if pedestrian traffic is heavy. An intersectional configuration which does not permit an easy merging of right-turns with cross traffic is in itself sufficient reason for not installing a right-turn arrow. Heavy pedestrian traffic on the affected crosswalk, regardless of intersection alignment and number of right turns per cycle, is yet another deterrent to an arrow installation.

Accident Analysis

An analysis of available accident reports at the nine locations in Kansas City where right-turn arrows are in effect, proved inconclusive. Unfortunately, the accident reports do not distinguish between right turns made on the green arrow and those made on a normal green light. This fact rendered any attempt at an extended accident analysis somewhat meaningless. One or two facts did emerge from the accident study, however. First, there could be discovered no accidents that occurred between a right turning vehicle and a pedestrian who was walking at right angles to the path of the car. Although, at first glance, this appears significant, two factors combine to greatly reduce its seeming importance. First, the extremely small amount of available data for Kansas City, makes the statistical sample entirely too small to have any reliability. Secondly, the number of this type of accident to pedestrians gives but a scant clue to the actual hazard imposed by the green arrow. It is quite possible, though no proof can be cited, that the accidents that did occur to pedestrians were a result of pedestrians focusing their attention on the vehicles turning on the arrow, to the exclusion of the two other opposing traffic streams.

The other fact that the accident study revealed was that no discernible trend existed toward a disproportionate number of pedestrian accidents of any type at intersections where right-turn arrows are in effect. Again, this cannot be construed as significant due to the inadequacy of sample size.

The generally inconclusive character of the accident report analysis led to the development of a check, which it is believed gives a truer picture of the effect of right-turn arrows on pedestrian traffic than does the mere office analysis of accident records.

Field Studies

Five intersections, each having a right-turn arrow on one approach only, were selected for study. The following information was obtained at each intersection, and was broken down by cycles: (Only the approach having the right-turn arrow was checked).

1. Number of right-turns on green
2. Number of right-turns on green arrow
3. Total number of right-turns
4. Pedestrians crossing at right-angles to through traffic
5. *Interference* to pedestrians crossing with their green light against vehicles turning right on the arrow.

The last item is believed the critical point checked. "Interference" was deemed to exist whenever it was clear that a pedestrian crossing at right-angles to the vehicles turning right on the green arrow, either had to give up his right-of-way to a vehicle or was allowed to cross unhindered by a right-turning vehicle either slowing or stopping. In other words, "interference" occurred whenever a potential conflict existed between a pedestrian and a vehicle turning on the arrow, which conflict was resolved by either the person or the driver relinquishing his right-of-way. It was noted dur-

ing the studies that in *nearly every case* the right-turning vehicle usurped the pedestrian's theoretical right-of-way. It should be clearly remembered that every single case of interference recorded *represented a potential vehicle-pedestrian accident*, and furthermore, that *the potential for these accidents would have been entirely absent if the right-turn arrow was not present.* The checks taken are summarized in Tables I - V.

INTERSECTION I

RIGHT-TURN ARROW FOR NORTHBOUND TRAFFIC

	Time	Rt. Turn On Green	Right Turns On Green Arrow	Total Right Turns	Peds. On South X-Walk	No. of Peds. Interfered With	Per Cent Interfered With
CHECK 1	1 Hr.	158	64	222	6	0	0.0%
CHECK 2	1 Hr.	131	63	194	11	1	9.1%

INTERSECTION II

RIGHT-TURN ARROW FOR SOUTHBOUND TRAFFIC

	Time	Rt. Turn On Green	Right Turns On Green Arrow	Total Right Turns	Peds. On North X-Walk	No. of Peds. Interfered With	Per Cent Interfered With
CHECK 1	1 Hr.	120	59	179	2	0	0.0%

INTERSECTION III

RIGHT-TURN ARROW FOR EASTBOUND TRAFFIC

	Time	Rt. Turn On Green	Right Turns On Green Arrow	Total Right Turns	Peds. On West X-Walk	No. of Peds. Interfered With	Per Cent Interfered With
CHECK 1	1 Hr.	206	420	626	64	40	62.5%
CHECK 2	35 Min.	111	248	359	53	27	51.0%
CHECK 3	1½ Hrs.	285	659	944	84	51	60.7%
CHECK 4	2 Hrs.	395	713	1108	132	56	42.5%
CHECK 5	2 Hrs.	447	815	1262	138	93	67.4%

INTERSECTION IV

RIGHT-TURN ARROW FOR EASTBOUND TRAFFIC

	Time	Rt. Turn On Green	Right Turns On Green Arrow	Total Right Turns	Peds. On West X-Walk	No. of Peds. Interfered With	Per Cent Interfered With
CHECK 1	1½ Hrs.	572	488	1060	5	3	60.0%
CHECK 2	1½ Hrs.	628	406	1034	7	5	71.4%

INTERSECTION V

RIGHT-TURN ARROW FOR SOUTHEASTBOUND TRAFFIC

	Time	Rt. Turn On Green	Right Turns On Green Arrow	Total Right Turns	Peds. On West X-Walk	No. of Peds. Interfered With	Per Cent Interfered With
CHECK 1	1½ Hrs.	618	489	1107	6	1	16.6%
CHECK 2	1½ Hrs.	625	438	1063	8	1	12.5%

These checks supply enough data so that an attempt at setting up warrants for right-turn arrows can be made. Some of the suggested warrants are of necessity, non-mathematical, and have already been discussed, but will bear repeating.

Warrant 1: Only install right-turn arrows where the physical alignment of the intersection insures no serious conflict between right-turning vehicles and through traffic from the cross street green light. This warrant should hold regardless of pedestrian traffic. Inspection of the intersection will most generally determine whether such a warrant is met.

Warrant 2: Only install right-turn arrows where careful field study and volume counts show it to be impossible to handle potential right-turning vehicles by a normal green light. If it *is* possible to do so, the arrow should not be installed, regardless of the degree of pedestrian traffic.

The field checks supply the basis for the semi-mathematical third warrant. The data presented suggests that, where pedestrian traffic is forced to cross against a steady stream of right-turning cars, about 50 to 60 per cent of the pedestrians will have to give up their right-of-way or be hit. Where pedestrian volumes are very low, the per cent interfered with varies a good deal, but where foot traffic is heavy enough to be statistically reliable, the figure of 50 to 60 per cent appears often enough to be thought significant.

Unfortunately, time did not permit the gathering of enough field data to establish beyond a doubt the exact relationship, if any, that exists between pedestrian volumes and

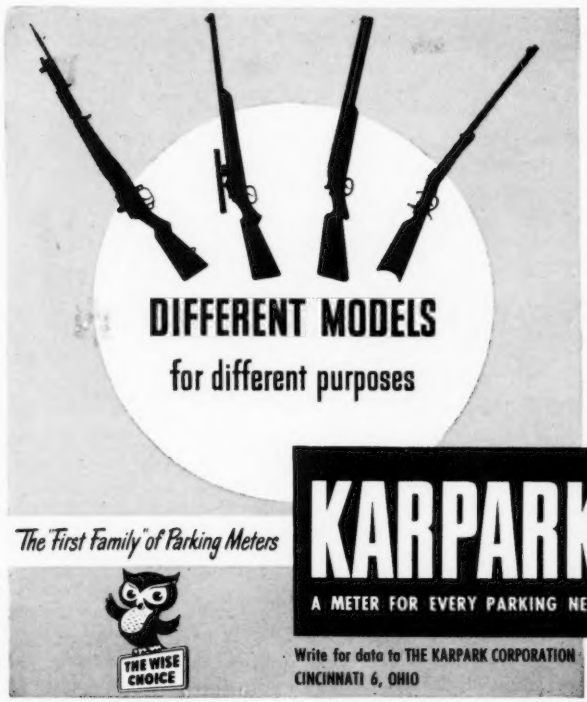
percentage of pedestrians that are interfered with. The data shown herein indicates, but does not conclusively prove, that no such relationship exists. That is, the data taken thus far seems to point to the fact that about 50% of the pedestrians on the affected crosswalk wlil be interfered with, regardless of total pedestrian volumes. Even so, it would be nonsensical to use a "percentage of interference" factor as a warrant for this reason: If pedestrian traffic was extremely light, the use of a per cent warrant would lead to the obviously foolish rejection of a right-turn arrow even if only one or two pedestrians were actually interfered with.

The foregoing leads to the favoring of a strictly *numerical* warrant, based exclusively on pedestrian volumes. The volume of right-turns on the arrow is not believed the critical point, since under Warrant 1, an arrow would only be in effect if the right turning movement was heavy to begin with. The situation then is briefly, assuming that right-turns are frequent enough to always interfere with a substantial per cent of pedestrian traffic, be it light or heavy, what is the numerical amount of pedestrian traffic per time period, above which the calculated risk of a right-turn arrow should not be undertaken? This question cannot as yet be answered with a pure number, but an attempt can be made to set up a range of values. For example, with a pedestrian volume of eight per hour on the affected crosswalk during the peak pedestrian period, it can be expected that on the average about 50% or four of these persons will be interfered with by vehicles turning on a right-turn arrow. It appears reasonable to take this risk, always remembering that daily fluctuations will cause a slight variation in both the pedestrian volume and the number of pedestrians encountering interference.

On the other hand, with a pedestrian volume of 40 per hour, approximately 20 persons per hour will be forced to give up their right-of-way or be hit. In this instance, it would appear that the right-turn arrow would create a risk that should not be taken. The two examples given were purposely selected to show instances where the decision was more or less clear. There is, of course, a range of volumes between eight and forty per hour, where the decision is not obvious and would have to be tempered with judgment and a knowledge of existing conditions.

Since pedestrian traffic is, if anything, less predictable than vehicle flow, it would not appear reasonable to set down any precise pedestrian volume above which a right-turn arrow should be flatly turned down. It is believed that until a great deal more data are obtained and analyzed, any such single figure is premature. However, a working range of 8-40 persons per hour is considered as a reasonable beginning. At the lower end of the range there would have to exist other compelling reasons why a right-turn arrow should *not* be installed; at the higher end of the range many other excellent reasons should exist *for* the installation.

The point to be remembered above all else is that *any* right-turn arrow on red installation should be made only after extreme caution has been exercised and a careful study made. Such an installation, even if warranted, is a *calculated risk*, which discriminates against pedestrians to the benefit of vehicular travel. At best, the installation will expedite vehicle flow and prove hazardous to only a few pedestrians. *but it will prove hazardous;* at worst, the right-turn arrow is a device that discriminates heavily against many pedestrians and much other traffic merely to allow a few more right turns per cycle to be made.



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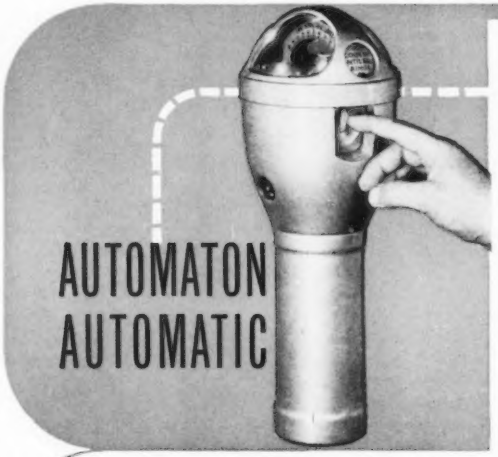

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By George C. Lichty
Assist. Traffic Engineer, Bureau of Maintenance
Missouri State Highway Commission, Jefferson City, Missouri

Tests to Determine a Splash Pattern for Signs in Missouri

One of the major headaches of the highway maintenance field employee has been to keep highway signs clean. This headache was always aggravated by his boss and the boss' boss forever going over his section of highway shortly after a rain and pointing out how dirty the signs were in his district. In all probability they had been thoroughly cleaned the week before. The motorist, of course, comes into the picture and should receive maximum sign service.

In our Missouri highway maintenance department the problem of cleaning highway signs seems to be an ever present one. We strive to give the motorist the fullest advantage of our signing program, and the field maintenance man the least amount of headaches; but to date we are not satisfied with the results.

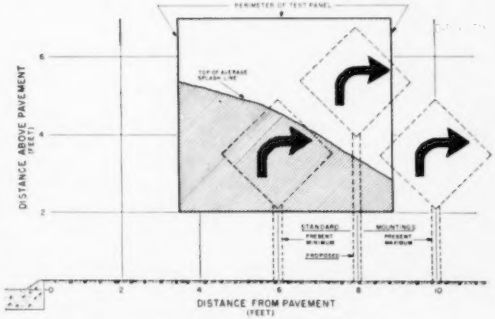
Tests have been made in the past by erecting signs at distances from twelve to sixteen feet from the edge of the pavement, and even back of the ditch line. We were not satisfied with the results of these tests, however, because of a lack of night sign visibility. From a pure maintenance standpoint there were some advantages to this back of the ditch signing. Very little cleaning, if any, was required, and the damage from vehicle traffic was eliminated. One disadvantage, however, was the interference with spot mowing required on back slopes in the early summer. Also, the increase in distance from the pavement edge (and variation from national standards) did not appeal to our traffic engineering department because of the potential hazard to the drivers who might not see the signs at all.

As the splash caused by moving vehicles from wet pavements was the sole source of our headache, it was decided to attack this demon in a different manner. Why not find the strength of this demon, splash, and then set our signs beyond his reach? Two test panels were erected where we thought average conditions existed, one along an 18-foot (no lip) concrete pavement, and the other along 20-foot lip type pavement. The panels consisted of four striped guide boards 10 inches wide and 60 inches high, reflectorized with glass spheres, placed in a vertical position and spaced 18 inches apart. The center of the nearest board was four feet from the edge of the pavement, and the farthest 8 feet 6 inches. The bottoms of the panels were 2 feet above the edge of the pavement.

After several months a splash pattern was quite evident. Measurements were taken along the top line indicated by the splash. Then, each of our ten division engineers was instructed to erect two test panels, using the same system and in the same manner as followed in our first two tests. With the variation in soil conditions, speeds, and pavements, we anticipated gaining a fairer average than could be obtained from panels placed in the same vicinity.

To date, four of the divisions have reported a fairly definite splash pattern being formed on the test panels, and have forwarded the information to the main office. These results are shown on the splash pattern sketch. The lip type pavement appears to give the highest line of splash by about 6 inches. When all the splash pattern tests have been received, it will then be determined how high and how far signs should be erected from the edge of the pavement to normally remain out of reach of the splash from moving vehicular traffic.

The information submitted is completely "preliminary" in character, and is submitted at this time to stimulate further tests in other states. From the results thus far, however, we have no doubt that signs can be erected within the limits prescribed by the Manual of Uniform Traffic Control Devices, prepared by the joint committee of A.A.S.H.O., the I.T.E., and the National Conference on Streets and Highway Safety, give maximum visibility and cleanliness at all times, and require far less maintenance than in the past.



SPLASH PATTERN SKETCH

Open Discussion

EDITOR'S NOTE: *Open Discussion in March carried "Accident Rates Based on Exposure Time" by William R. McGrath, and in April "A Challenge to Traffic Engineers" by Nathan Cherniack. Both authors invited comment and two readers whose letters follow, have responded. We hope others will do likewise.*

EXPOSURE TIME ACCIDENT RATES

Dear Mr. McGrath: Allow me to compliment you on your paper "Accident Rates Based on Exposure Time." It is good to see someone attempting to find the proper base for the comparison of traffic accident rates. Since the Editor's Note invites comment (Traffic Engineering, March 1952, Page 228), I submit the following:

Time is undoubtedly a measure of exposure and makes it possible to compare traffic hazard with other hazards. Surely the 50,000 mile per year driver may expect more accidents than if he drove only 5,000 miles in the same way. Many Insurance Companies recognize this in their rates. Your conclusion represents a valuable addition to research in this field. However, there is an important pitfall, which must be recognized, within the practical, as compared to the statistical field.

Is time more indicative than distance? It seems to me that the aspect of the "human desire" is not pertinent.

If we assume that time is indicative, then it follows that the slower one makes a given trip, the greater is his hazard; and that the faster he travels, the safer he is. Of course, neither of these statements are necessarily true, nor would reverse statements be true.

The chances are that the nearer he drives to the median speed, or within the "pace", i.e., staying in line and avoiding the overtaking maneuver — perhaps the most hazardous maneuver on the road—the better are his chances. If all vehicles moved at the same speed, there would be no overtaking maneuvers. Thus, neither the shortest nor the longest driving time for a given distance represents the safest condition, with other things being equal, since changes in exposure may be offset by changes in hazard.

So, while I agree that time may be a good statistical measure of exposure, it should be made clear that this assumes travel to be at or near the median speed prevailing on the facility. Otherwise, we may open up a Pandora's box; and, in effect, advise the driver to "pour on the coal" and outrun the accident. I would caution you to include this consideration in any future publications, and caution others that this assumption is important.

Another point worthy of note is this: If time is to be used as a measure of exposure—how do we determine time spent in motor vehicles? To do so, we must use *distance* and *assume* rates of speed. What then, have we gained by the added assumption? We know reasonably well the distance travelled from vehicle counts verified by taxed gasoline. Time spent, however, involves unnecessary assumptions and, therefore, becomes less accurate.

It is my hope that you will receive these comments in the intended constructive spirit.

James S. Burch, (Mem., ITE)
Engineer Statistics and Planning
North Carolina State Highway and Public Works Commission, Raleigh, N. C.

A CHALLENGE TO TRAFFIC ENGINEERS

Dear Sir: I have read your article entitled "A Challenge to Traffic Engineers," published in the April issue of Traffic Engineering. While I have been in the Traffic Engineering field only a short time, I have already come to know the reasons why the role of a Traffic Engineer is becoming more and more important in the Highway Engineering profession. Therefore, I'd like to speak my piece in defense of the Traffic Engineer.

Dean Gallion says that a Traffic Engineer is a repairman and a deviser, which in a sense is true, but I believe he must *also* be a builder and a planner. The Traffic Engineer is a deviser only because a traffic condition will be dumped in his lap for correction, a condition that has developed due to lack of foresight by the city planners of a few years ago, and he must devise a method to overcome this adverse condition. In these days when most of our cities have narrow streets and very high traffic volumes, a Traffic Engineer must do the best things possible with certain static conditions that can't be changed. Certainly corrective measures such as one-way streets, traffic signals, signs and other devices are needed for ailing cities, just as medicine is needed to correct an ailment in the body. An architect can design a new building or remodel an old one to suit the requirements of its occupants, but a Traffic Engineer can't re-design a city when hundreds of buildings might conceivably have to be moved to make way for wider streets, longer curves, et cetera, to meet changes in traffic requirements. Now on *new* highways and *new* city streets when a Traffic Engineer is consulted, the conditions considered are not only the present needs, but also those for as much as 20 years in the future. The Traffic Engineer has a chance to employ the experience gained in devising corrective measures for old, poorly designed pavements that carry many times their designed capacity of vehicular volume. It has been our experience in this area that, if proper corrective measures are prescribed and administered, the condition will be improved. However, these measures must be based on facts rather than opinions.

In the example on traffic signals which Dean Gallion cited in his chapter on "Negative Control," I believe he did not finish the overall picture. First of all, if traffic signals are set on a 1 minute cycle with 30 seconds for each phase, he has assumed that at this particular intersection the cross street carries the same volume of traffic as the major street. If there is negligible traffic on the cross street then traffic signals are not warranted, and should not be used. Assuming that the total volume warranted signals, that the traffic was evenly divided and that twelve movements were permitted at the intersection, then there would be less confusion with the use of traffic signals than if no control were used. If no stop control were used, one can imagine the confusion that would exist. If stop signs were present on only the side streets then it would be difficult, if not impossible, for that traffic to enter the flow of traffic on the non-stopped street.

If a 4-way stop was initiated then the total volume of traffic handled during a specified time would be cut considerably, as every vehicle would have to stop before crossing the intersection. There are facts to prove that, with a large volume of traffic, signals do not lessen the volume handled at a given intersection but, under described conditions, would tend to increase the volume that the intersection could handle.

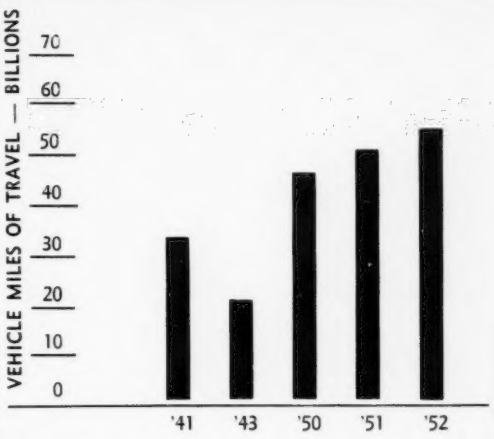
Even in the case of a new highway, some control will be necessary. The traveling public will have to be told how to use the highway or a multiple level grade separation, if it is to be used properly. Therefore, lane lines, signs, signal lights and various means of giving information must be used so that the motorist will know what to do.

Dean Gallion's ideas toward Traffic Engineering typify those of the people who confront the Traffic Engineer when corrective measures are prescribed for a bad traffic condition. Today, thanks to the efforts of many long hours by the pioneers in Traffic Engineering, it is no longer a battle of ideas, as there can be no argument against cold, hard facts which the present day Traffic Engineer can produce to prove a point.

As long as there are vehicles on our highways there will have to be some sort of mass control and, as time passes, I believe the prestige of the Traffic Engineers who plan these controls will increase.

Vernon T. Kupel
2111 McCord Street
Murphysboro, Illinois

Traffic Trends



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The following illustrates how right-of-way is transferred under varying conditions of traffic demand. Note that phases are skipped on which no traffic is present. Each phase has time extension and memory. A typical four-interval signal color sequence is used. G, Y, and R stand for green, yellow, and red signals.

(a) It is assumed that demand is present on each traffic phase. Note that the dispatcher includes each phase in the cycle.

Period :	1	2	3	4	5	6	1
Street A:	G	Y	R	R	R	R	G
Street B:	R	R	G	Y	R	R	R
Street C:	R	R	R	R	G	Y	R

(b) Here it is assumed that when the green light is ready to leave Phase A there is demand on Phase B, but when ready to leave Phase B, there is no demand on Phase C. Therefore Intervals 5 and 6 for Phase C are omitted from the cycle, and the green light skips to Phase A where there is a demand.

Period :	1	2	3	4	1
Street A:	G	Y	R	R	G
Street B:	R	R	G	Y	R
Street C:	R	R	R	R	R

(c) In this example, when the green light is ready to leave Phase A there is no demand on Phase B, so Intervals 3 and 4 for Phase B right-of-way are skipped, and the green light goes to Phase C in response to demand there. From Phase C it goes to Phase A where there is also demand.

Period :	1	2	5	6	1
Street A:	G	Y	R	R	G
Street B:	R	R	R	R	R
Street C:	R	R	G	Y	R

(d) The assumption here is that there is demand on Phases B and C, but temporarily no demand on Phase A.

Period :	3	4	5	6	1
Street A:	R	R	R	R	R
Street B:	G	Y	R	R	G
Street C:	R	R	G	Y	R

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TRAFFIC NEWS

1951 Traffic Engineering Winners Announced By ITE

Nathan Cherniack, President of the Institute of Traffic Engineers, on May 14, 1952, announced the ten states and eighteen cities in the United States honored by the Institute for outsanding performance in traffic engineering during the year 1951.

The six winning states and ten cities were selected by the Judges as deserving national recognition will be awarded plaques. The awards are based on outstanding traffic engineering achievement, including traffic control devices, surveys of traffic problems, street lighting, intersection design, traffic administration and highway planning.

In announcing the award winners, Mr. Cherniack said, "States and cities selected for awards in every case exemplify the value of continuing sound traffic engineering programs. The most pressing problem facing American states and cities today is the ever mounting tide of traffic. Only by such technical traffic engineering approaches proven by the achievements of these winners can we hope to keep ahead, or even abreast of that tide."

Forty-seven states and 678 cities participated in the contest. The awards were decided on information submitted in the Traffic Engineering Section of the Annual Inventory of Traffic Safety Activities.

The awards by *states* were decided in four regional groups and a fifth group including the eight most thickly populated and heavily trafficked states. The awards are as follows:

GROUP I—Eastern Region with 9 states—First Place, *Delaware;* Second Place, *New Jersey.*

GROUP II—Southern Region with 11 states—First Place, *Virginia;* Second Place, *Florida.*

GROUP III—Midwest Region with 9 states—First Place, *Minnesota;* Second Place, *Wisconsin.*

GROUP IV—Western Region with 10 states—First Place, *Washington;* Second Place, *Colorado.*

GROUP V—Eight Most Heavily Populated and Trafficked States—A duplicate First Place, *California* and *Michigan.*

The winning *cities* and second places are:

Groups I, II and III combined had 16 cities competing.

GROUP I—For population of 1,000,000 and over, First Place *Detroit,* Michigan; Second Place, *Los Angeles,* California.

GROUP II—For population of 750,000 to 1,000,000—First Place, *Cleveland,* Ohio; Second Place, *Boston,* Mass.

GROUP III—For population of 500,000 to 750,000—A duplicate First Place, *Milwaukee,* Wisconsin, and *Buffalo,* New York.

GROUP IV—For population of 350,000 to 500,000, with 10 cities competing—First Place, *Kansas City,* Mo.; Second Place, *Denver,* Colorado.

GROUP V—For population of 200,000 to 350,000 with 17 cities competing—First Place, *Providence,* R. I.; Second Place, a tie between *Rochester,* N. Y., and *Syracuse,* N. Y.

GROUP VI—For population of 100,000 to 200,000 with 41 cities competing—First Place, *Flint,* Michigan; Second Place, *Evansville,* Indiana.

GROUP VII—For poulation of 50,000 to 100,000 with 81 cities competing—First Place, *Evanston,* Illinois; Second Place, *Kalamazoo,* Michigan.

GROUP VIII—For population of 25,000 to 50,000 with 165 cities competing—First Place, *Miami Beach,* Fla.; Second Place, *Haverhill,* Mass.

GROUP IX—For population of 10,000 to 25,000 with 348 cities competing—First Place, *Rocky River,* Ohio; Second Place, *Wilmette,* Illinois.

The Institute of Traffic Engineers directs the assembly of traffic engineering accomplishments submitted by the states and cities upon which the awards are based as determined by a Committee of Judges consisting of prominent engineers and administrators who were:

Chairman Thomas H. MacDonald, Commissioner, Bureau of Public Roads;

Thomas N. Boate, Accident Prevention Dept., Assoc. of Casualty & Surety Companies;

George C. Bowers, Traffic Division, International Association of Chiefs of Police;

J. J. Cavanagh, Chicago Motor Club;

Norman Damon, Vice-President, Automotive Safety Foundation;

Hal H. Hale, Executive Director, American Association of State Highway Officials;

Albert B. Houghton, Chairman, Special Committee on Traffic Courts, American Bar Association;

Donald M. McNeil, Vice-President, Institute of Traffic Engineers;

Earl W. Merritt, American Association of Motor Vehicle Administrators.

Harry Porter, Jr., Secretary-Treasurer of the ITE, served as Technical Advisor to the Committee of Judges.

Fourth Businessmen's Urban Problem Conference Meets

Common problems arising with the rapid growth of America's cities and towns will be examined at the Fourth Businessmen's Conference on Urban Problems being held at Portland, Oregon, June 23 and 24 by the Chamber of Commerce of the United States in cooperation with the Portland Chamber.

The conference will consider four major difficulties that have come with increasing traffic and through changes brought about by almost universal use of motor transportation. They are: overall planning, streamlining of urban traffic, off-street parking, and redevelopment of blighted areas. The subjects listed will be taken up in four general panel discussion sessions and at two evening

(Continued on page 345)

Charles R. Waters Honored by Alma Mater

Union College of Schenectady, New York, awarded an honorary degree of Doctor of Engineering upon Charles R. Waters of Buffalo, New York, at the commencement exercises held at the College on June 8, 1952. Mr. Waters has been District Engineer in the State Department of Public Works at Buffalo since 1926. He has been a member of the Institute of Traffic Engineers since 1949.

Photo by Fabian Bachrach

Charles R. Waters

A career man in the State service, Mr. Waters has been continuously employed in the State's engineering departments since he received his baccalaureate degree at Union College. He has had a long, varied and successful engineering career in which he has been engaged in the administration of major executive positions and in the building of many large and important public projects aggregating in the neighborhood of $200 million. His various posts have carried enhanced responsibilities as the years have passed and his sphere of influence has reached outside of the State to the national field.

He is one of the representatives of the American Association of State Highway Officials on the group which establishes the standards for traffic control devices on streets and highways throughout the United States. He has been a leader in the movement for uniformity in signs, signals and pavement markings on the North American continent. He directs the operation of the State Shop near Buffalo where highway signs for the entire State are manufactured, and at the present time he heads the State Committee which is studying the problem and will make recommendations for the types of signs to be installed on the new Thruway now under construction

(Continued on page 346)

Lieutenant Allen Returns From Army

Robert J. Allen, chief traffic engineer of the Association of Casualty and Surety Companies' accident prevention department for three years before he was recalled to active military duty in January 1951, has returned to his former position with the Association, it was announced recently by J. Dewey Dorsett, general manager.

As a lieutenant of the Army Corps of Engineers, Mr. Allen saw service in

Robert J. Allen

this country, Japan and Korea as an accident prevention specialist. At Panmunjom, Korea, following the accident last year in which a hydrogen-filled identification balloon exploded near the truce negotiators' tent and injured a number of soldiers, he carried out successfully a special project to prevent future explosions of such ballooons, which are used to identify the armistice conference area to combat aircraft. He also served for four months as assistant chief, fire prevention division, general headquarters of the Far East Command, with responsibility for fire prevention and protection in all military installations in Japan, Korea, Okinawa, Guam and the Philippines.

In Tokyo, Mr. Allen was safety director of the engineer section of Far East Command headquarters. He was responsible for accident prevention among military personnel, Army civilians and more than 10,000 of their Japanese employees in the Japanese capital. Before going to Japan he was assistant safety director of the Second Army, with headquarters at Fort George G. Meade, covering army installations within a seven-state area.

Mr. Allen, who holds a master of science degree in traffic engineering

(Continued on page 346)

Julien Harvey Honored By American Transit

Julien H. Harvey, one of the country's best known pioneer safety specialists, on May 22, 1952, was honored by the American Transit Assocaition for his contributions to safety in the transit industry. A silver medallion on a mahogany base was presented to Mr. Harvey by Guy C. Hecker, A.T.A. executive manager, at the annual American Transit Safety Awards luncheon in Philadelphia in the Bellevue-Stratford Hotel.

Julien H. Harvey

The American Transit Safety Awards, among the oldest in the country, were inaugurated in 1914. They are given annually to transit companies in the United States and Canada with outstanding safety records.

In announcing the award, Mr. Hecker cited Mr. Harvey's long service as member and chairman of the Awards Committee during the years 1942 to 1952, until his resignation recently upon the occasion of his general retirement, and his career which began over 40 years ago as a lawyer in Kansas City. Within a short time, Mr. Harvey had branched into safety work through organization of a company program to reduce and prevent accidents. This program proved so successful that in 1916 he was asked to assist in organizing the city's safety council and became its first president.

In 1918, Hecker continued, he joined the National Safety Council and organized the country's first complete community safety program for the City of Rochester. After a distinguished career with N.S.C., he became first executive vice-president of the Greater New York Safety Council, and in 1938 was called to head the Accident Prevention Department of the Association of Casualty and Surety Companies, from which position he recently retired.

LOOKING AHEAD

JUNE 23-24, 1952—PORTLAND, OREGON
Fourth National Businessmen's Conference on Urban Problems, Multnomah Hotel.

AUGUST 24-27, 1952—LOS ANGELES, CALIF.
American Public Works Association, Ambassador Hotel, Shrine Auditorium.

SEPTEMBER 8-11, 1952—CHICAGO, ILLINOIS
Annual Meeting, Institute of Traffic Engineers, Hotel Sherman.

SEPTEMBER 8-13, 1952—CHICAGO, ILLINOIS
Illuminating Engineering Society National Technical Conference, Edgewater Beach Hotel.

SEPTEMBER 20-24, 1952—ATLANTIC CITY, N. J.
Annual Meeting, American Transit Association.

SEPTEMBER 21-25, 1952—LOS ANGELES, CALIF.
International Association of Chiefs of Police, Biltmore Hotel.

SEPTEMBER 28-OCTOBER 2, 1952—KANSAS CITY, MISSOURI
International City Managers Assn.

SEPTEMBER 29-OCTOBER 2, 1952—BOSTON, MASSACHUSETTS
Annual Convention, International Municipal Signal Assn., Inc., Hotel Statler.

OCTOBER 5-8, 1952—BOSTON, MASSACHUSETTS
American Society of Planning Officials, Copley-Plaza Hotel.

OCTOBER 6-10, 1952—NEW YORK CITY
American Trucking Association—18th Annual Convention, Waldorf-Astoria Hotel.

OCTOBER 17-18, 1952—CHICAGO, ILLINOIS
The President's Highway Safety Conference.

OCTOBER 20-24, 1952—CHICAGO, ILLINOIS
40th National Safety Congress and Exposition of the National Safety Council.

Spring Parking Hazard

Last month when Edward Burns, parking meter collector in Central Falls, Rhode Island, opened a meter an 18-inch snake poked his head out of the coin box.

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Minnesota Court Upholds Ordinance Regulating Parking Lots

The Minnesota State Supreme Court, in an opinion handed down in the case of State v. United Parking Stations, Inc., has held that the provisions of a Minneapolis ordinance licensing and regulating open air parking lots, which require every licensee thereunder to post signs at each entrance and exit showing rates charged for parking, and other information, are a reasonable exercise of the police power and do not violate due process clauses of the federal and state constitutions.

The parking lot in question had two entrances, at each of which signs bearing only the word "parking" were posted. A small shanty was located on the lot about 140 feet from the main entrance and about 30 feet from the alley entrance at the rear. Patrons entering the lot were directed to drive up to the building where they were orally informed as to parking rates by an attendant. On the side of the shanty was a sign showing the license number of the licensee and the hourly rates charged. The exact size of the figures on this sign was in dispute, but these figures were not visible from either entrance to the parking lot. Evidence disclosed that there was a sign on the door of the shanty which was apparently intended to inform patrons where they might pick up their automobile keys if the attendant were gone.

The operator of the parking lot contended that these signs were evidence of substantial compliance with the ordinance. He also challenged the constitutionality of the quoted provisions of the ordinance on the ground that they were an unreasonable exercise of the police power. He asserted that to enforce said provisions in this case would be arbitrary and capricious.

The court stated that the ordinance provisions in question were apparently designed to inform a motorist *before* entering the lot of the rates charged therein, so that he might go elsewhere if the rates seemed too high. The motorist who was required to enter the lot to find out the rate must, if dissatisfied, either leave the lot at the expense of personal inconvenience and congestion of the public streets or stay and pay a rate he would not have paid had it been make known to him earlier. The provisions of the ordinance might also be directed at the prevention of fraud and misrepresentation, which was clearly permissible within the police power.

In light of the apparent purposes of the pertinent section of the ordinance the court stated, a finding of substanital compliance with the ordinance was not warranted in this case. Enforcement of the ordinance was neither arbitrary nor capricious.

Yearbook Changes

DOYLE, LOWELL J. (Assoc.)
Traffic Survey Engineer
Michigan State Highway Dept.
222 Townsend
Lansing 13, Michigan. 5-8121, Ext. 23 & 24

ELLIOTT, EARNEST W. (Junior)
High Ridge Road
South Glastonbury, Conn.

HARVEY, JULIEN H. (Honorary)
109 - 13th Street
Box Number 1206
Pass-a-grille, Florida

HIGGINS, HERBERT C. (Assoc.)
Route 6, Box 142
Olympia, Washington

HOFFMAN, MAX R. (Junior)
6712 Lake Street
Apartment 202
Falls Church, Virginia

MATYAS, LT. (J. G.) CURT A. (Junior)
U. S. Marine Corps Air Station
Public Works Department
Miami, Florida

McNEIL, DONALD M. (Member)
Consultant Engineer
706 Benedum Trees Building
223 Fourth Avenue
Pittsburgh 22, Pennsylvania

MICHALSKI, CHARLES S. (Assoc.)
Traffic Engineer
Citizens Traffic Safety Board
20 North Wacker Drive
Chicago 6, Illinois. ANdover 3-0161

PLUTAE, PAUL (Assoc.)
4143 North 10th Street
Phoenix, Arizona

PRATHER, J. GORDON (Junior)
2453-D Silver Lake Blvd.
Los Angeles 39, California

TODD, M. MANSFIELD (Assoc.)
Executive Secretary
Institute of Traffic Engineers
211 Strathcona Hall
New Haven 11, Connecticut

1952 Annual Meeting

Make your plans *now* to attend the ITE Annual Meeting, September 8-11, at the Sherman Hotel, Chicago, Illinois.

New Appointment . . .

The appointment of Mr. Charles S. Michalski to the position of Chief Traffic Engineer for the Citizens Traffic Safety Board, of Chicago, was announced on May 5, 1952, by Mr. Franklin D. Sturdy, Director, who said "The Board is indeed fortunate to secure Mr. Michalski's services to fill this most important position." To accept the Chicago appointment, Mr. Michalski resigned his post as Chief Engineer, Department of Traffic, City of New York, to which he was appointed December 1, 1951.

Charles S. Michalski

A native of Detroit, he received his Bachelor's Degree in Electrical Engineering in 1939 from Wayne University, following which he was employed by the Traffic Engineering Bureau, City of Detroit, and, in September 1942 was promoted to Junior Traffic Engineer in charge of the Traffic Signal Division.

He entered the United States Navy as a Radio and Radar Material Officer in June 1943. His naval career included special courses in Radar Ultra-High Frequency Techniques at Bowdoin College and Massachusetts Institute of Technology following which he served on the staff of the commander of a task force where he was responsible for the installation, maintenance, and operation of all radio and radar equipment on the flagship, and the coordination of radio and operation techniques for all ships of the task group. For outstanding achievement he was the recipient of the Bronze Star Medal for Meritorious Service.

Following his discharge in February 1946 he resumed his work with the Detroit Traffic Engineering Bureau, Division of Expressway and Thoroughfare Design. During the next three years his duties included the planning and design of street widenings, new construction, channelization and pedestrian islands and service on several sub-committees related to traffic engineering and expressway planning.

In February 1949 he accepted the position of Engineer of Traffic Design with the City of New York, Department of Traffic, following which he was instrumental in the development of the comprehensive traffic planning for Manhattan, preferential street planning for other Boroughs, a trial installation of parking meters and numerous surveys necessary for traffic improvements.

Mr. Michalski is an Associate Member of the Institute of Traffic Engineers, a Military Engineer Member of the Society of American Military Engineers, and a member of the Tau Beta Pi honor fraternity. He and Mrs. Michalski are the parents of three children.

National Par Committee Completes Organization

Achievement of adequate roads for America was given further impetus when the National PAR (Project-Adequate Roads) Committee met in Washington in May and voted to expand its organizational structure. The meeting was held in conjunction with the Fourth Highway Transportation Congress, sponsored by the National Highway Users Conference.

Objective of the National PAR Committee is to propel a movement to help get America "out of the traffic muddle." It seeks to further sound road and street programming so as to eliminate bottlenecks and other road and street inadequacies, with top priority given to most urgent needs. The movement has been compared in scope to the "out of the mud" campaign of thirty years ago, when the nation demanded and got a network of hard-surfaced roads.

The PAR temporary operating committee agreed to select a Chairman and one or more vice-chairmen and appoint any other necessary committees, such as public relations, engineering, and finance. The next meeting of the National PAR Committee will be subject to the call of the chairman after his selection by the PAR operating committee.

Considerable discussion during the meeting centered around the necessity of carrying the PAR message to the states so that state PAR committees may be organized early where needed.

This was the second meeting of the National PAR Committeee, an organization made up of the principals of forty of the country's largest national groups, interested in America's highway system. Included are such representative groups as the U. S. Chamber of Commerce, the National Grange, the National Association of Motor Bus Operators, the American Trucking Associations, the American Automobile Association, the National Association of Manufacturers, among others. The organization was formed at a meeting in New York about three months ago. It was initiated by the National Highway Users Conference, a group which, itself, includes many large national organizations, plus 1,200 state organizations through its own State Conference affiliates.

Secretary of the National PAR Committee is Arthur C. Butler, director of NHUC. In his report of progress since the formation of the Committee, Mr. Butler cited a wealth of publicity as evidence of need for interest in the PAR movement. He also pointed to the fact that the first state PAR Committee is already organized and working, in Tennessee. The National Committee expects state and county PAR Committees to mushroom as the movement gets well underway.

Mr. Butler concluded his report with a plea for "industry, imagination and energy" as the only means of achieving "adequate roads for a stronger America." "The enormity of our task is outweighed only by the opportunity it offers for public service," Mr. Butler told his audience of top-flight executives from various parts of the country.

21 Engineers Complete Yale Course

Twenty-one men completed the graduate course in traffic engineering at the Bureau of Highway Traffic, Yale University, in June. These men will join 270 engineers already in the field who have completed the course of study at the Yale Bureau.

Many of the men returned to their former positions with various state highway departments and city agencies.

(Continued on page 347)

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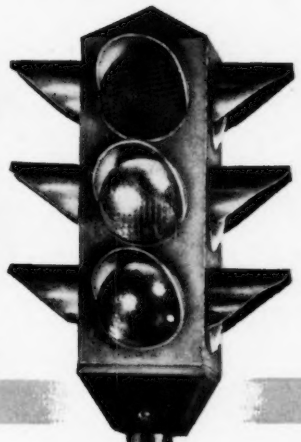

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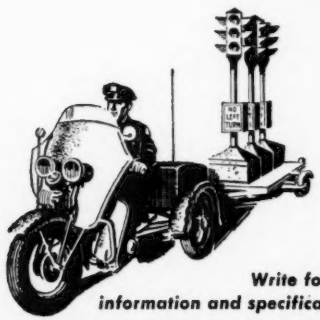

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SECTION NEWS

Midwest Section

The April meeting of the Midwest Section was held at the Chicago Engineers Club on April 4 to coincide with the date of the meeting of the Board of Direction of the I.T.E. President Bill Marston introduced each of our guests who included Messrs. Nathan Cherniack, Donald M. McNeil, Fred W. Hurd, F. M. Carter, John B. Ecker, J. Edward Johnston, Harry E. Neal, Joseph L. Wehmeyer and Light B. Yost. After each of the members of the Section had introduced themselves, Bill Marston asked Nat Cherniack to say a few words.

Cherniack stated that he was quite pleased with the progress of 1952 convention planning. The entire idea of the Centennial of Engineering, said Cherniack, is to make the public understand what engineering is. The I.T.E. has an opportunity to go even further by presenting Traffic Engineering to both the public and other engineers. For this reason we should strive to keep the language of technical papers simple so that anyone attending any of our technical sessions can easily understand what is being said. Cherniack went on to say that we should stop complaining about the quantity of accidents and blaming people for driving carelessly. Rather, we should compliment those who are good drivers and "brag" about safety accomplishments. We should take our cue from the insurance salesman who sells life insurance, not death insurance.

During the business portion of the meeting which followed, the new constitution and by-laws of the Section were discussed. After a few minor changes the members voted to accept the new documents and submit them to the Board of Direction for final approval.

After brief reports from the convention committees and standing committees the meeting was adjourned.

Reported by Ralph F. Gross
Secretary-Treasurer

Washington, D. C., Section

The Washington Section, in an attempt to increase attendance at their regular meetings, tried a luncheon meeting on Wednesday, April 30th at the New Athens Restaurant, 1741 K Street, N.W. The success of this move was immediately apparent when thirty-eight members and guests turned out for the affair.

The speaker of the day was Mr. Joseph Barnett, Chief, Urban Road Branch of the U. S. Bureau of Public Roads. Mr. Barnett said that he would like to confine his remarks to three phases of urban road development—(1) limited access facilities; (2) bridge approaches and (3) the greater use of sketch drawings in preliminary design stages. Apparently the three subjects were of a broad interest to the gathering because after the talk there were many questions from the floor.

Ken Rykken announced that the next meeting had been scheduled for June 4th at the Officer's Mess of the Naval Gun Factory. This meeting will be the Annual Business Meeting and Ladies' Night. The nominating committee has submitted the following slate for consideration of the Washington Section:

For President—W. H. Voltz.

For Vice-President—G. K. Gravelle, W. D. Heath.

For Secretary-Treasurer—H. K. Evans, J. I. Knott.

Reported by W. D. Heath
Secretary-Treasurer

Western Section

President Joe Havenner will preside at the Annual Business Meeting of the Section scheduled for 9:15 A.M., Friday, June 27. On the Agenda are items of policy on WITE fiscal year change, financial assistance to area National Officers and Directors attending ITE Board meetings; reports of area activities and installation of new officers.

Dick Wilson, General Chairman, and Bob Glenn, Arrangements Chairman, are making all arrangements. A boat trip on San Francisco Bay is being planned for Saturday afternoon, June 28, for delegates desiring to make this scenic trip.

Northern California—Bruno Dentino and Charlie Zell (Dist I at Eureka) are working on coordination of timing of closely-spaced signals on a state highway in Ukiah. They will welcome anyone stopping in Eureka on their way through this scenic part of Northern California.

Texas—Our automatic reporter informed us that Bob Buckman (Fort Worth) has been given an award for breaking more bottlenecks than any other Traffic Engineer in the U. S. The award was given by the National Bottlers Association!

New Mexico and Arizona — John Caarls is following the lead of Hank Barnes in using an all-red pedestrian interval at a troublesome location. Ross Shoaf would like to use it also at one intersection, but is afraid that it would work so well that he would be besieged by requests to use it at other locations where it would not work.

Wayne Morris has sold his One-way street program to the Phoenix City Council. Wayne and Chuck Haley are busy working out problems of signing, fire routing, and similar problems.

Washington—Win Carsten reports that a Chamber of Commerce Committee in Olympia recommends doubling the parking meter fees in order to provide additional revenue for traffic control purposes. He asks whether anyone has data on results obtained with doubling the fee.

E. E. (Lew) Lewarch is to be City Traffic Engineer of Seattle, following retirement of Arch Bollong in June. Bruce Culver is to be Lew's No. 1 Assistant. Best of luck, Lew and Bruce!

Colorado—John Bruce is joining Denver's T. E. group as Assistant Traffic Engineer. John formerly was Traffic Engineer with Joe Havenner.

Southern California — Forty-seven attended a dinner meeting of the S. C. Area group in Burbank the evening of April 16. Bill Paige showed a film "A City is Born," prepared by the City of Burbank. Joe Havenner and Bob Glenn outlined plans for the Western ITE annual meeting.

Paul Harding, Ass't State Highway Engineer, Division of Highways, spoke on problems in freeway planning, design and operation. He outlined techniques for determining potential traffic at interchange points, and stressed the need for cooperation between the many agencies involved in freeway planning.

The Far South (In California)—The San Diego Mayor and City Council held a public hearing on the proposed one-way street system for the downtown business district on April 8. Both proponents and opponents were heard in a full three-hour meeting concerning the proposal, with a final vote on the resolution held over for four weeks.

Edward Hall, recently appointed Traffic Engineer of San Diego County, is getting settled in his new position.

Mel West, Division XI Traffic Engineer, is in the middle of several big projects, including preparation for the formal opening on April 17th of the new Montgomery Freeway to the South Bay Area of San Diego. A volume study on principal streets and State highways in the City of San Diego has recently been completed, and a new signal layout at Rosecrans and Highway 101 is being installed, which will permit four-

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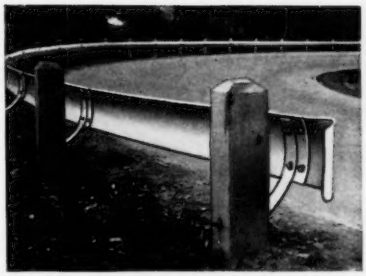
(Continued from page 339)

meetings on June 23. Two luncheon sessions also will be held.

City traffic difficulties are dealt with under the heading, "Streamlining Urban Traffic." The session discussing that subject will present a panel of men who have had practical experience with the problem.

This panel will look into practical means for getting more use out of existing streets, as well as the building of new traffic arteries. The panel will examine the problem with a view to preserving business and property values. An account of successful plans for traffic improvement will be given.

Off-street parking will be thoroughly discussed by a joint panel representing those who hold that private enterprise offers the best solution and those who would have municipal governments take the lead in finding the answers.



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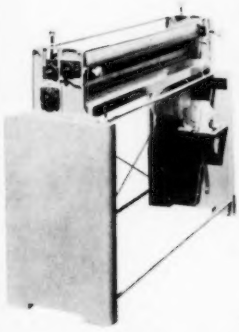

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Principal Engineer — Traffic (2 openings)

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Minimum Qualifications:

Graduate of an accredited Engineering College, plus a post-graduate course in traffic engineering. At least 5 years of active engineering practice, of which 2 years would be in the field of traffic engineering. Possession of a professional engineer's license.

Duties:

Under direction of Chief Engineer—Traffic, to supervise all traffic engineering activities and cooperate with and assist local, county and state traffic officials in connection with improved methods of regulation, control and solution of various traffic problems; supervise the preparation of engineering reports and handle correspondence relating to traffic engineering matters and coordinating in-service training for traffic engineering personnel.

Senior Engineer—Traffic (2 openings)

Salary: $4,740 - $5,940 per year

Minimum Qualifications:

Graduate of an accredited Engineering College, plus a post-graduate course in traffic engineering. At least 2 years of active engineering practice, of which 1 year would be in the field of traffic engineering.

Duties:

Under direction of Principal Engineer, to supervise various traffic engineering activities including traffic control, regulation, planning, speed zoning, speed rating, no passing zones, etc.

Traffic Engineer — Assistant (3 openings)

Salary: $3,840 - $4,740 per year

Minimum Qualifications:

Graduate of an accredited Engineering College. Prefer one year's active practice in engineering, preferably in traffic engineering. One year of post-graduate work in traffic engineering to be equivalent to one year of active practice in traffic engineering.

Duties:

Will collect, compile, record, analyze and interpret data relating to traffic conditions, will make traffic surveys and prepare reports making suitable recommendations, and will consult local, county and state officials in traffic control and traffic engineering problems.

Apply:

Department of Law and Public Safety

Bureau of Traffic Safety

32 East Hanover Street

Trenton, New Jersey

(Continued from page 340)

across New York State.

Considerable credit has been given Mr. Waters for his engineering achievements in connection with his handling of the vast projects conceived and now in the construction stage for the relief of highway and street traffic in Buffalo and Western New York. A previous honor that was bestowed upon him was the citation by the Buffalo Evening News when it named him as one of twelve citizens outstanding for public service during 1950. The New York State Society of Professional Engineers honored him in May 1950, as an "Engineer of Achievement" along with two other engineers of national prominence.

Mr. Waters directs the activities of one of the largest engineering organizations in Western New York and supervises the work of the contractors engaged in the building of public works of all kinds in which the State is engaged in this territory. The projects currently under way in the District exceed $25 million in value. Many firms of consulting engineers are employed under the direction of Mr. Waters to assist the local organization in the preparation of plans and designs for Thruway and Arterial projects.

That the highways in Western New York are generally in good condition is largely because as author of the so-called "Waters" Plan, he has furthered the idea of stretching the dollar so that a large mileage of rural highways and roads could be kept in traveling condition by resurfacing and widening, rather than by following the more costly policy of complete rebuilding.

Mr. Waters has taken a special interest in subjects relating to the advancement of the engineering profession, and has endeavored to have raised the qualifications for engineering positions in the State service, and also to require that men holding responsible engineering positions in industry, and in other lines of endeavor, should be licensed professional engineers. He is a past President of the Erie County Chapter of Professional Engineers. He is the author of many published articles on highway construction and related subjects and a frequent speaker on these topics at official meetings.

Mr. Waters' ancestors were pre-revolutionary settlers in the Mohawk Valley and although he was born in Steuben County, New York, it was natural that he should enter Union College when he started his engineering training. Since graduation he has maintained an active interest in Union College Alumni affairs, and is past President of the Alumni Association of both Buffalo and Albany.

Mr. Waters is a member of the National Society of Professional Engineers, the Institute of Traffic Engineers and of several social and professional groups and societies. He is a Trustee of the Westminster Presbyterian Church of Buffalo. He lives with his wife and three daughters, of school age, at 68 Richmond Avenue, Buffalo.

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from the University of Illinois, will carry out the accident prevention department's comprehensive traffic and safety programs, which he had previously helped to develop and expand before being recalled to military service as an Army reservist. These include assistance with the publication of the "Traffic Engineering Handbook" and the development af such publications as the "Manual of Traffic Engineering Studies," "Traffic Engineering and the Police," "Motor Vehicle Inspection Manual," and the series of case histories of traffic engineering projects which have reduced accidents, deaths and injuries, published regularly as "Getting Results Through Traffic Engineering" bulletins.

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way movement with an advance movement controller. Four new pedestrian signals have been installed on El Cajon Boulevard at Oregon, Euclid, 54th and 70 Streets. These will relieve patrol boys who have been protecting these school crossings in the past.

Two members of the ITE appeared at a recent meeting of the Institute on Government sponsored by San Diego State College. Mel West, District XI Traffic Engineer, Division of Highways was panel chairman for the Traffic Safety Section. Included in the panel of experts was Jim Reading, who spoke on "Accident Prevention."

Oregon—An Orgeon area meeting of the Western Section was held in Portland in March through the arrangements of "Bud" George, Area Chairman, and "Robbie" Robinson, Area Activities Chairman. The entire area was well represented by an attendance of 50 which was greater than that of any previous meeting.

Mr. Lloyd Keefe, Director of the Planning Commission for the City of Portland, was the speaker for the evening. Mr. Keefe's presentation of "Tomorrow's Cities," illustrated by slides and charts, was a technical presentation that proved interesting to all. The area representatives hope to continue these technical presentations by members of the traffic engineering and allied professions at future meetings.

Attending the meeting were 11 members of ITE and 39 non-members including three manufacturer's representatives. Bruce Crandall and Herb Higgins were spotted in the vicinity of the refreshment counter. Skinny DeYoung and Jim Gallagher were also seen in that general vicinity.

Reported by Donald S. Berry
Secretary-Treasurer

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Four of the men have positions in the urban traffic egineering offices of Baltimore, Maryland; Boston, Massachusetts; and New Orleans, Louisiana.

Eight men have gone to the planning and traffic engineering divisions of the state highway departments of California, Kentucky, Michigan, New York, and Washington.

Four men went to positions in the Mexico Highway Administration, the Cities of Zurish, Switzerland; Mombay, Indio; and Montrealfi Canada.

Two men have joined consulting firms, and the remaining three have obtained positions in closely allied fields.

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Secretary's Column

Last month's issue announced that I had become your new Executive Secretary, but naturally could make no mention of my deep personal appreciation to the Board of Direction and the members of the *Institute* for their confidence in affording me this opportunity to assume the responsibility. Nor could it express my appreciation for the nice letters so many of you were kind enough to write.

I have approached the preparation of this first column with misgivings, for it is difficult to put into printed words the various thoughts I'd like to convey. I'd never realized how much the activities of Headquarters influence the ever growing prestige of the *Institute*, nor how much the working committee members contribute to the success of our organization. I did not realize the personal sacrifices of the Board of Direction members in serving the membership. Neither did I realize the necessity or scope of the field of traffic research to which the *Institute* will be so valuable when finances permit it doing the job that needs be done.

Yes, my first month in the post was an enlightening one. Not a day passed but what a new problem or new experience arose. And not a day passed that my admiration for the capabilities of Fred Hurd, your immediate past Executive Secretary, didn't mount appreciably. Fred had to devote half of his time to duties as Associate Professor for the Yale Bureau of Highway Traffic, leaving in theory, half of his time for Headquarters work. But that job couldn't be done in half of anyone's time and the result was Fred had to work on Institute affairs at night, holidays and Sundays, so that the poor guy had no free time at all. The *Institute* owes a large debt of gratitude to Fred—and the Bureau of Highway Traffic for making it possible—for such an able performance under difficult circumstances. He is still standing by to render the worthwhile advice that's so often needed.

My first "baptism" as Executive Secretary occurred after I'd been eight days on the job when I was privileged to attend a dinner meeting of the New England Section at Hartford as an unofficial goodwill ambassador of Headquarters. About 40 engineers including some 30 ITE members were in attendance at this interesting meeting. My first official job occurred next day in connection with the ITE awards for traffic engineering (Traffic News, this issue) involving the dispatch of thirty congratulatory announcement telegrams and confirmatory letters to seventy individuals, with only two minor slips being recorded.

On Saturday, May 17, I attended the annual outing meeting of the Metropolitan New York Section, also attended by about 10 New England Section members. We assembled at 10:30 A.M. at the Port Authority Building on the New Jersey side of the George Washington Bridge — where an impartial observer noted numerous ITEers, in trying to reach the parking space, violating no-left-turn regulations, but the cops weren't looking. Twenty-seven of us piled on the bus provided by the Section and were conducted on a tour of the New Jersey Turnpike. Ed Ricker did a capable job as rubberneck bus conductor, ballyhooing the principal traffic engineering features, ably assisted by Guy Kelcey on the section the latter's firm engineered.

We turned around at Interchange Eight and after a delightful lunch at one of the Turnpike concession restaurants as guests of the Section, returned to New York about 4:00 P.M. Section President Ed Cyr is congratulated with appreciation on arranging this interesting and informative trip.

I would be remiss indeed if I failed to take this opportunity of pledging my best efforts in continuing the Headquarters operations in the pathway pioneered so well by Bob Holmes, and pushed onward so ably by Fred Hurd, to the end that the *Institute* shall ever grow in prestige, authority and service.

TIM TODD

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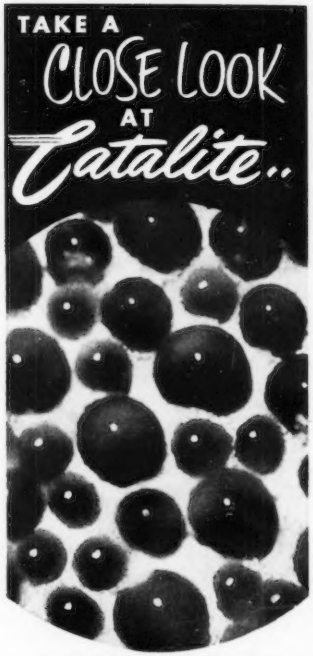
New Haven 11, Connecticut



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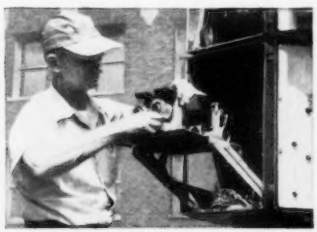

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